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ABSTRACT

This final volume of the report on the training program in educational evaluation and development at the University of Colorado contains four appendixes: 1) "Vitae of Project Staff"; 2) "Progress Report and Evaluation of the Graduate Research Training Program and the Laboratory of Educational Research"; 3) "Sample Measurement Instruments," including course evaluation inventory, trainee attitude scale, and trainee questionnaire on program operations; and 4) "Evaluation of the Long-Range Effects of a 1967 Research Training Presession." (Related documents are SP 005 100, 101, and 102). (MBM)

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FINAL REPORT

TECHNICAL PAPER NUMBER 3A

APPENDICES A-D

U.S. DEPARTMENT OF HEALTH,
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Appendix A:	Vitae of Project Staff
Appendix B:	Progress Report and Evaluation of the Graduate Research Training Program and the Laboratory of Educational Research
Appendix C:	Sample Measurement Instruments
Appendix D:	Evaluation of Long-range Effects of a 1967 Research Training Presession

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TECHNICAL PAPER NUMBER 3

APPENDIX A

VITAE OF PROJECT STAFF

Resumé

Name: Gene V Glass

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University of Colorado
Boulder, Colorado 80302

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Boulder, Colorado 80302

Phone: Office: 303-443-2211, Ext. 7922 or 6935
Home: 303-444-4787

Date of Birth: 19 June 1940

Place of Birth: Lincoln, Nebraska

Wife's Name: Sharon Lea Glass

Children: Julie Evann Glass (born 18 October 1963)

Educational Record:

1958-1960 Nebraska Wesleyan
1960-1962 University of Nebraska (BA with honors from Teachers College; major--German, minor--mathematics; teaching certificate).
1962-1963 University of Wisconsin (MS in Educational Psychology).
1963-1965 University of Wisconsin (Ph.D in Educational Psychology with minor in Statistics).

Graduate Courses Taken

Course	Instructor	Year
Educ. Meas	J. C. Stanley	1962
Statistics	J. C. Stanley	1962
Math. Statistics	N. R. Draper	1962
Probability Theory	J. Coleman	1962
Factor Analysis	C. W. Harris	1963
Measurement Theory	J. C. Stanley	1963
Test Theory	F. M. Lord	1963
Factor Analysis	H. F. Kaiser	1963
Analysis of Variance	N. R. Draper	1964
Human Learning	T. Johnson	1964
Seminar in Learning	H. Klausmeier	1964
Computers in Social Sciences	F. B. Baker	1964
Seminar in Learning	T. Johnson	1964

Honors: Winner of American Institute for Research Creative Talent Award for the area of Measurement and Evaluation for 1964-1965.

Member of Delta Phi Alpha - German Honorary Society.

Employment History:

Co-Director, Laboratory of Educational Research, Colorado University, June 1967-present.

Associate Professor, School of Education, Colorado University, July 1968-present.

Assistant Professor, School of Education, Colorado University, June 1967-June 1968.

Assistant Professor, Department of Educational Psychology, University of Illinois, September 1965-June 1967.

Assistant Professor, Research, CIRCE, College of Education, University of Illinois, September 1965-June 1967.

Visiting Lecturer, School of Education, University of Wisconsin-Milwaukee, June 1964-February 1965.

Research assistant, Central Wisconsin Colony (an institution for the mentally retarded), Madison, Wisconsin, June 1963-September 1963.

Teaching assistant, Department of Educational Psychology, Laboratory of Experimental Design, University of Wisconsin, June 1963-August 1963.

Project assistant, Department of Educational Psychology, University of Wisconsin, February 1963-June 1963.

Research assistant, Department of Educational Psychology, University of Wisconsin, June 1962-August 1962.

Teaching assistant, Department of Educational Psychology, University of Wisconsin, February 1962-August 1962.

Research assistant, Department of Educational Psychology and Measurement, University of Nebraska, September 1962-February 1962.

Membership in Professional Organizations:

Psychometric Society
American Educational Research Association
National Council on Measurement in Education
Phi Delta Kappa (Men's Honorary in Education)
American Psychological Association

Publications:

1962:

Glass, G. V. and Stanley, J. C. Effects of Correction for Differential Omissions on the Internal Consistency of Tests. Paper presented at the annual convention of the Psychonomic Society, 27 August 1962, St. Louis, Mo.

1963:

Glass, G. V. Chance Successes and the Reliability of Tests. Madison, Wis.: Dept. of Educ. Psych., Univ. of Wis., 1963. Unpublished Master's thesis. 51 pp.

Stevens, H. A.; Sindberg, R. M.; Morgan, Jean R.; and Glass, G. V. A Study of the Extendor Role for Professional Nurses-Pilot Phase. Paper presented at the annual convention of the Great Lakes Region, American Association of Mental Deficiency, October 1963, Northville, Mich.

Glass, G. V and Baker, F. B. *Mnemonic Device for Computing Sums of Squares in the Analysis of Variance*. Occasional Paper No. 3. Madison, Wis.:

Glass, G. V and Stanley, J. C. Review of Van Dalen and Meyer's *Understanding Educational Research*. *Educ. and Psychol. Meas.* 23; 1963. Pp. 217-219.

Glass, G. V and Stanley, J. C. Review of Ray's *Introduction to Experimental Design*. *Educ. and Psychol. Meas.* 23; 1963. Pp. 207-208.

Stanley, J. C. and Glass, G. V. Review of Hammond and Householder's *Introduction to the Statistical Method*. *Comtemp. Psych.* 8; 1963. Pp. 374-375.

Glass, G. V. Review of Weinberg and Schumaker's *Statistics: An Intuitive Approach*. *Educ. and Psychol. Meas.* 23; 1963. Pp. 849-851.

1964:

Glass, G. V and Wiley, D. E. *Formula Scoring and Test Reliability.* Paper presented at the joint convention of the AERA and NCME, February 1964, Chicago, Illinois.

Glass, G. V and Harris, C. W. *Factor Analysis of True Scores*. Paper prepared for the Working Group on Factor Analysis, December 1964, Urbana, Ill.

Harris, C. W.; Glass, G. V; and Meinke, D. L. *Repeated Measures Analysis in Experiments in Learning*. Paper presented at the annual convention of the American Psychological Association, 1964, Los Angeles, Calif.

Glass, G. V and Wiley, D. E. Formula Scoring and Test Reliability. *Jour. of Educ. Meas.* 1; 1964. Pp. 43-49.

Glass, G. V. How may Salience of a Membership Group be Aroused? *Jour. of Educ. Meas.* 1; 1964. Pp. 125-129.

Glass, G. V and McLean, L. D. A Posteriori Correction for Guessing in Recognitive Tasks. *Amer. Jour. of Psych.* 77; 1964. Pp. 664-667.

Glass, G. V and Wiley, D. E. Review of Hays's *Statistics for Psychologists*. *Educ. and Psychol. Meas.* 24; 1964. Pp. 724-726.

Glass, G. V. Review of Edward's *Expected Value of Discrete Random Variables* and Elementary Statistics. *Educ. and Psychol. Meas.* 24; 1964. Pp. 969-971.

Stanley, J. C. and Glass, G. V. Review of Thorndike's *The Concepts of Over- and Underachievement*. *Teacher's College Record* 66; 1964. Pp. 282-284.

1965:

Glass, G. V. *A Ranking Variable Analogue of* r_{bis}: *Implications for Short-cut Item Analysis*. Paper presented at the annual joint convention of AERA-NCME, February 1965, Chicago, Ill.

Glass, G. V. Evaluating Testing, Maturation, and Gain Effects in a Pretest-Posttest Quasi-Experimental Design. *Amer. Educ. Res. Jour.* 2; March 1965. Pp. 83-87.

Glass, G. V. *The Resolution of Complexes of Infallible Variables into Common Factors and Principal Components*. Madison, Wis.: Dept. of Educ. Psych., Univ. of Wis., May 1965. Unpublished Ph. D. thesis. 188 + vi pages.

Morgan, Jean R.; Glass, G. V; Stevens, H. A.; and Sindberg, R. M. A Study of an Extendor Role for Nursing Service Personnel. *Nursing Research* 14, No. 4; Fall 1965. Pp. 330-334.

Glass, G. V. A Ranking Variable Analogue of Biserial Correlation: Implications for Short-cut Analysis. *Jour. of Educ. Meas.* 2; 1965. Pp. 91-96.

Glass, G. V. *Discussion of Papers by Campbell, Phillips, Stanley, and Yee*. Paper presented at the Division 15 Symposium on Experimental and Quasi-experimental Designs in Psycho-educational Research, at the annual convention of the American Psychological Association, 5 September 1965, Chicago, Ill.

Glass, G. V. and Mattson, D. E. Review of Mouly's *The Science of Educational Research*. *Educ. and Psych. Meas.* 25; 1965. Pp. 260-262.

1966:

Glass, G. V. *Discovery of Factors in Teachers' Perceptions of Students*. Paper presented at the 50th annual meeting of the American Educational Research Association, 17 February 1966, Chicago, Ill.

Glass, G. V. Testing Homogeneity of Variances. *Amer. Educ. Res. Jour.* 3; No. 3; May 1966. Pp. 187-190.

Glass, G. V. Note Concerning Rank Biserial Correlation. *Educ. and Psychol. Meas.* 26, No. 3; Autumn 1966. Pp. 623-631.

Glass, Gene V and Robbins, Melvyn P. *A Critique of Experiments on the Role of Neurological Organization in Reading Performance*. Curriculum Laboratory Working Paper No. 6.. Urbana, Illinois: Univ. of Illinois, October 1966. 70 pp.

Glass, Gene V and Taylor, Peter A. Factor Analytic Methodology. *Rev. of Educ. Research* 36, No. 5; December 1966. Pp. 566-587.

Stake, R. E. Glass, G. V; and Taylor, P. A. *Report of the Evaluation of the AERA 1966 Presession on the Design of Educational Experiments*. Urbana, Ill.: Center for Instructional Research and Curriculum Evaluation, Univ. of Ill., 1966. 95 pp. (Mimeograph.)

Glass, Gene V. Alpha Factor Analysis of Infallible Variables. *Psychometrika* 31; December 1966. Pp. 545-561.

Glass, Gene V. *Consequences of Failure to Meet the Assumptions Underlying the Analysis of Variance*. Urbana, Ill.: College of Education, Univ. of Illinois, 1966. 37 pp. (Mimeograph.) [A review of the literature.]

Glass, Gene V and Maguire, Thomas O. Abuses of Factor Scores. *Amer. Educ. Res. Jour.* 3, No. 4; 1966. Pp. 297-304.

Glass, Gene V and Maguire, Thomas O. Review of Ferguson's *Statistical Analysis in Psychology and Education*. *Educ. and Psychol. Meas.*, Winter 1966. Pp. 1075-1078.

1967:

Robbins, Melvyn P. and Glass, Gene V. The Doman-Delacato Rationale: A Critical Analysis. *Research Paper No. 2*. Boulder, Colo.: Lab. of Educ. Res., Univ. of Colo., August 1967. 43 pp.

Maguire, Thomas O. and Glass, Gene V. *Component Profile Analysis--An Alternative to PROF*. Research and Information Report, Div. of Educational Research Services. Edmonton, Alberta, Canada: Univ. of Alberta, October 1967.

Glass, Gene V and Robbins, Melvyn P. A Critique of Experiments on the Role of Neurological Organization in Reading Performance. *Research Paper No. 4*. Boulder, Colo.: Lab. of Educ. Research, Univ. of Colo., October 1967. 70 pp.

Glass, Gene V. Review of *Educational Measurement for the Classroom Teacher* by Smith and Adams. *Educational Forum* 31, No. 2; 1967. Pp. 245-246.

Millman, Jason and Glass, Gene V. Rules of Thumb for Writing the ANOVA Table. *Jour. of Educ. Meas.* 4; 1967. Pp. 41-51.

Glass, Gene V. Factors in Teachers' Perceptions of Students. *Jour. of Educ. Meas.* 4; 1967. Pp. 87-93.

Glass, Gene V and Robbins, Melvyn P. A Critique of Experiments on the Role of Neurological Organization in Reading Performance. *Reading Research Quarterly* 3; 1967. Pp. 5-51.

Maguire, Thomas O. and Glass, Gene V. A Program for the Analysis of Certain Time-Series Quasi-Experiments. *Educ. and Psychol. Meas.* 27; 1967. Pp. 743-750.

Glass, Gene V. Review of Rozeboom's *Foundations of the Theory of Prediction*. *Amer. Educ. Res. Jour.* 4, No. 4; 1967. Pp. 398-401.

Glass, Gene V. Review of Remmers, Gage, and Rummel's *A Practical Introduction to Measurement and Evaluation*. *Educational Forum* 31; March 1967. Pp. 372-373.

1968:

Glass, Gene V. Reflections on Bloom's "Toward a Theory of Testing which Includes Measurement-Evaluation-Assessment." Paper read at the Symposium on Problems in the Evaluation of Instruction, December 13-15, 1967, Los Angeles, Calif, UCLA. (Also appears as *Research Paper No. 8*. Boulder, Colo: Lab. of Educ. Research, Univ. of Colo, December 1967, and as *Occasional Paper No. 11*, UCLA, Center for the Study of Evaluation, September 1968.)

Maguire, Thomas O. and Glass, Gene V. Component Profile Analysis (COPAN)--An Alternative to PROF. *Educ. and Psychol. Meas.* 28, No. 4; Winter 1968. Pp. 1021-1033.

Glass, Gene V and Maguire, Thomas O. *Analysis of Interrupted Time-Series Experiments*. Paper presented at the annual meeting of the American Educational Research Association, 8 February 1968, Chicago, Ill.

Glass, Gene V and Maguire, Thomas O. *Analysis of Time-Series Quasi-Experiments*. Boulder, Colo.: USOE Report #6-8329, Lab. of Educ. Research, Univ. of Colo., May 1968.

Glass, Gene V. Correlations with Products of Variables: Derivations and Implications for Methodology. *Amer. Educ. Res. Jour.*, November 1968. (Also appears as *Research Paper No. 9*. Boulder, Colo.: Lab. of Educ. Research, Univ. of Colo., January 1968.)

Glass, Gene V. *Report of the American Educational Research Association 1968 Research Training Presessions Program*. July 1968. 365 pp.

Glass, Gene V. Author's Guide and Style Manual for the *Review of Educational Research*. Washington, D. C.: American Educational Research Association, August 1968. 37 pp.

Glass, Gene V and Hakstian, A. Ralph. Measures of Association in Comparative Experiments: Their Development and Interpretation. *Research Paper No. 14*. Boulder, Colo.: Lab. of Educ. Research, Univ. of Colo., September 1968. (Also presented at the annual meeting of AERA; Los Angeles, Calif. 7 February 1969.)

Glass, Gene V. *Two Generations of Evaluation Models.* Paper presented at the Nebraska Personnel and Guidance Association Meetings, Lincoln, Neb. September 29, 1968.

Glass, Gene V. Educational Piltdown Men. *Phi Delta Kappa*, Vol. L, No. 3; November 1968. Pp. 148-151.

Bracht, Glenn H. and Glass, Gene V. The External Validity of Experiments. *Amer. Educ. Res. Jour.* 5; November 1968. Pp. 437-474.

Hopkins, Kenneth D. and Glass, Gene V. *Establishing a Graduate Research Training Program and the Laboratory of Educational Research*. Final Report USOE Project No. #6-1860. Boulder, Colo.: Lab. of Educ. Research, Univ. of Colo., November 1968.

Glass, Gene V. Correlations with Products of Variables: Derivations and Implications for Methodology. *Amer. Educ. Res. Jour.*, Nov. 1968.

Robbins, Melvyn P. and Glass, Gene V. The Doman-Delacato Rationale: A Critical Analysis. *Educational Therapy*, Winter 1968.

Glass, Gene V. Analysis of Data on the Connecticut Speeding Crackdown as a Time-Series Quasi-Experiment. *Law and Society Review*, Winter 1968.

Glass, Gene V. Review of C. M. Lindvall's *Measuring Pupils' Achievement and Aptitude*. *The Educational Forum* 32, No. 2; 1968. P. 251.

Hakstian, A. Ralph and Glass, Gene V. Review of Chassan's *Research Design in Clinical Psychology and Psychiatry*. *Educ. and Psychol. Meas.* 28; 1968. Pp. 621-623.

Glass, Gene V. Response to Traub's "Note on the Reliability of Residual Change Scores." *Jour. of Educ. Meas.* 5, No. 3; 1968. Pp. 265-267.

1969:

Stanley, Julian C. and Glass, Gene V. A Simple Proof that the Sum of the Squared Errors in Estimating Y from X via b_1 and b_0 is Minimal. *American Statistician*, January 1969. Pp. 25-26.

Stephens, W. Beth; Glass, Gene V; McLaughlin, John A.; Miller, Charles K. *The Factorial Structure of Reasoning, Moral Judgment, and Moral Conduct.* Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, Calif., 6 February 1969.

Bauman, Daniel L.; Glass, Gene V; and Harrington, Scott A. The Effects of the Position of an Organizer on Learning Meaningful Verbal Material. *Research Paper No. 24.* Boulder, Colo.: Lab. of Educ. Research, Univ. of Colo., January 1969. (Presented at the annual meeting of AERA, Los Angeles, Calif., 6 February 1969).

Mendro, Robert L. and Glass, Gene V. The Approximate Sampling Distribution of the Stratified Alpha Generalizability Coefficient. *Research Paper No. 26.* Boulder, Colo.: Lab. of Educ. Research, Univ. of Colo., January 1969. (Presented at the annual meeting of AERA, Los Angeles, Calif., 7 February 1969.)

Glass, Gene V. The Growth of Evaluation Methodology. *Research Paper No. 27.* Boulder, Colo.: Lab. of Educ. Research, Univ. of Colo., March 1969. 15 pp.

Peckham, Percy D.; Glass, Gene V; and Hopkins, Kenneth D. The Experimental Unit in Statistical Analysis. *Research Paper No. 28.* Boulder, Colo.: Lab. of Educ. Research, Univ. of Colo., March 1969.

Glass, Gene V. *Plan for the Future of the Review of Educational Research.* Paper prepared for the Association Council of the American Educational Research Association. April 1969. 12 pp.

Ross, H. Lawrence; Campbell, Donald T.; Glass, Gene V. The British Crackdown on Drinking and Driving: A Successful Legal Reform. *Research Paper No. 29.* Boulder, Colo.: Lab. of Educ. Research, Univ. of Colo., May 1969. 30 pp.

Glass, Gene V; Sanders, James R.; and Jurs, Stephen G. *Mastery Test Items for Courses in Educational Research Methods.* Boulder, Colo.: Lab. of Educ. Research, Univ. of Colo., May 1969. 42 pp.

Glass, G. V. Note on Jensen and Rohwer's "Mental Retardation, Mental Age, and Learning Rate." *Journal of Educ. Psych.*, 1969, *60*, 415-416.

Collins, James R. and Glass, Gene V. Review of Baggaley's *Mathematics for Introductory Statistics, A Programmed Review.* *Educ. and Psychol. Meas.*, Fall 1969.

Glass, Gene V and Stanley, Julian C. *Statistical Methods in Education and Psychology.* Prentice-Hall Publishing Company, 1970.

Glass, Gene V; Robbins, Melvyn P.; and Tuinman, Jaap. Delacato--Neurologische Organisatie en Leesonderwijs: Een Kritiek. Pedagogisch Forum. 1969, 6, 265-288.

Glass, Gene V and Masahito Okada. An Analysis of Delacato's Experimental Evidence. Pediatrics. (in press.)

Glass, Gene V and Collins, James R. Geometric Proof of the Restriction on the Possible Values of $\underline{r}_{xy}$ when $\underline{r}_{xz}$ and $\underline{r}_{yz}$ are Fixed. Educ. and Psychol. Meas. (in press.)

Professional Service:

Consulting Editor, American Educational Research Journal, December 1965-February 1969.

Advisory Editor, Journal of Educational Measurement, November 1967-

Consulting Editor, Educational and Psychological Measurement, October 1967-

Editor, Review of Educational Research of the American Educational Research Association, July 1968-February 1971.

Instructor, USOE Institute in Experimental Design and Analysis, Univ. of Wisconsin, Summer 1965.

Instructor, American Educational Research Association, 1966 Presession on Design of Educational Experiments, February 1966.

Instructor, Research Training Program for State Education Department Personnel, Denver University, April 1967.

Director, American Educational Research Association, 1967 Presession on Design and Analysis of Comparative Experiments, Sept. 1966-March 1967.

Director of Research Training Presession on Analysis of Variance Techniques, Convention of the American Vocational Association, December 2,3, 1967, Cleveland, Ohio.

Instructor in American Educational Research Association Research Training Session in Reading Research, February 3-7, 1968, Chicago, Illinois.

Chairman, American Educational Research Association, Research training Presessions Committee, February 1967-February 1968.

Member of American Educational Research Association, 1968 Program Committee, February 1967-February 1968.

Instructor in seminar in "Strategies for Rehabilitation Research with the Retarded" held at University of Oregon, Rehabilitation Research and Training Center, in Mental Retardation, 16 December 1968.

Chairman of Graduate Student Seminars Program, AERA Annual Meeting, 1970.

Chairman, Educational Testing Service Invitational Conference on Testing Problems, 1970.

Instructor in Workshop on Evaluation Methodology, Colorado State University.

1. June 1969 EPDA Directors
2. August 1969 State Department Personnel
3. September 1969 EPDA State Department Directors
4. October 1969 EPDA Directors

Bucknell Undergraduate Education Research Advisory Board, April 20-22, 1969.

Fellow, Institute for Epistemic Studies, New York University, August 1969-

Member of the Head Start Research and Evaluation Committee, Office of Economic Opportunity, November 1967-

Review Panel, Title IV of ESEA, 1965, USOE.

Field Reader, Bureau of REsearch, U. S. Office of Education, 1966-

Ad hoc reviewer for the following publications:

1. Sociological Methodology
2. Britannica Review of American Education
3. AERA Curriculum Evaluation Monograph Series
4. Psychometrika
5. Psychological Bulletin

Consultant to the following agencies:

1. Dept. of Educ. Psych., Temple University
2. Dept. of Psychology, Northwestern University
3. Project SESAME, Bucknell University
4. Nebraska State Dept. of Education
5. Social Sciences Education Consortium, Univ. of Colorado
6. Annual Reviews, Inc., Palo Alto, Calif.
7. Southwestern Cooperative Educational Laboratory, Albuquerque
8. Colorado State Dept. of Education
9. University of Wisconsin Medical School
10. U. S. Office of Education, Research Training Branch
11. Regional Educational Laboratory, St. Louis, Mo.

Recent Writings:

Glass, Gene V (with Daniel J. Booth, James R. Collins, Jon R. Erion, Jerry G. Horn, Helen H. James, Loretta A. Shepard, Dennis R. Wing). *Education of the Disadvantaged: An Evaluative Report on Title I of the Elementary and Secondary Education Act of 1965--Fiscal Year 1969*. Laboratory of Educational Research, University of Colorado, May 1970, 670 pp.

Burton, Nancy W. and Glass, Gene V. Review of Simon's Basic *Methods in Social Science: The Art of Empirical Investigation*. *Educational and Psychological Measurement*, Winter 1969.

Glass, Gene V. *A Colorado School Learning Assessment Program*. Paper presented to the Committee on Public Education of the Colorado Legislature, December 9, 1969.

Glass, Gene V. *Design of Evaluation Studies*. (31 pp.) Paper presented at the Council for Exceptional Children Special Conference on Early Childhood Education, New Orleans. December 13, 1969.

Wiley, David E.; Collins, James R.; Glass, Gene V. Sources of Variation in Multiple-Choice Test Performance. *Research Paper No. 37*. Laboratory of Educational Research: University of Colorado; Boulder, Colorado, March 1970. Presented at the Annual Meeting of the American Educational Research Association, 3 March 1970, Minneapolis, Minnesota.

Glass, Gene V. *Educational Knowledge Use*. Address to Orientation Program for the U. S. Office of Education 1969-70 Postdoctoral Fellows. Elkridge, Maryland, 15 September 1969. Presented in revised form to the Special Interest Group on Research Utilization at the Annual Meeting of the American Educational Research Association, 5 March 1970, Minneapolis, Minnesota.

Sanders, James R. and Glass, Gene V. *Short-term and Long-term Retention Effects of Adjunct Questions in Audio Discourse: An Extension of Research on Mathemagenic Behavior*. Paper presented at the Annual Meeting of the American Educational Research Association, 3 March 1970, Minneapolis, Minnesota.

Bracht, Glenn H. and Glass, Gene V. *Aptitude-treatment Interactions in Learning the Addition of Signed Numbers*. (Submitted to the *Journal Of Educational Psychology*.) Paper presented at the Annual Meeting of the American Educational Research Association, 3 March 1970. Minneapolis, Minnesota.

Glass, Gene V. Educational Measurement: New Methods for New Roles. Education Colorado,
Part I: A change in the concept of measurement, Vol. 5, No. 13. March 1970.
Part II: Binet testing approach was successful. Vol. 5, No. 14. March 1970.
Part III: Testing to measure abilities differs from testing to evaluate programs, Vol. 5, No. 15. April 1970.

Maguire, T.O.; Clark, A. K. and Glass, G. V. Individual differences in teachers' perceptions of students. (22 pages). (Submitted for publication.)

Glass, Gene V and Remer, Rory. Review of David J. Fox's The Research Process in Education. Contemporary Psychology, 1970, 15, 277-278.

Ross, H. Lawrence; Campbell, Donald T. and Glass, Gene V. Determining the Social Effects of a Legal Reform: the British "Breathalyser" Crackdown of 1967. American Behavioral Scientist, 1970, March/April, 493-509.

Recent Professional Service and Research:

Principal Investigator on "Education of the Disadvantaged: An Evaluative Report on Title I of the Elementary and Secondary Education Act of 1965--Fiscal Year 1969." December 1969-August 1970.

Panelist on "Applications of Operations Research to Educational Evaluation." Third Annual Operations Research Conference, National Bureau of Standards, Washington, D. C. 7 May 1970.

Awarded the Palmer O. Johnson Award by the American Educational Research Association in December 1969 for the best publication in the 1968 volume of the American Educational Research Journal. (Award given to Glenn H. Bracht and Gene V Glass as co-authors.)

Consultant to University of California-Santa Barbara on planning the Graduate School of Education. December 4-5, 1969.

Vita

Name: William L. Goodwin

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Birthdate: October 21, 1935 Birthplace: Galesburg, Illinois

Degrees: B. S. (with high distinction), Social Studies-Education, University of Nebraska, 1957.

M. Ed., Guidance and Counseling, University of Illinois, 1961.

Ph. D., Educational Psychology, University of Wisconsin, 1965 (Learning, Measurement, Research Design).

Artillery Officer, U. S. Marine Corps, June 1957 to June 1960.

University Fellow, University of Illinois, September 1960 to June 1961.

Social Studies Teacher, Central Senior High School, Madison, Wisconsin, September 1961 to June 1962.

NDEA Title IV Fellow in the Design of Experiments in Education, Department of Educational Psychology, University of Wisconsin, September 1962 to June 1965.

Research and Project Assistant, Department of Educational Psychology, University of Wisconsin. Full-time July to September 1962, one-fourth time September 1962 to June 1963, full-time June to September 1963 and June to September 1964.

Research Associate, Research and Development Center for Cognitive Learning, University of Wisconsin, June 1965 to August 1966.

Assistant Professor, Bucknell University, September 1966 to August 1970 (on leave September 1969 to August 1970). Also, Director, Educational Development Center.

Director of four U. S. Office of Education Grants under Title III, Elementary and Secondary Education Act: Planning Grant Project SESAME, Project SESAME A (Arts) and Project SESAME G (Games), Bucknell University, varying starting dates, September 1966 to August 1970 (on leave, September 1969 to August 1970).

USOE Post-doctoral Fellow, Laboratory of Human Development, Harvard University, September 1969 to August 1970. (Early childhood learning and development, evaluation and research methods, social intervention, motivation, attention, administration.)

Associate Professor, University of Colorado, September 1970 to present.

Leadership Training Institute Early Childhood Education Fellow, Education Professions Development Act, September 1970 to present.

Memberships in Professional Societies:

American Association for the Advancement of Science
American Educational Research Association
American Psychological Association
National Council on Measurement in Education
National Society for the Study of Education
Phi Delta Kappa

Articles and Reports:

Goodwin, William L. "Adjustment for Sex and Variability Differences on the Allport-Vernon-Lindzey Study of Values Profiles." Journal of Educational Measurement, 1964, 1, 55-58.

Goodwin, William L. "Effects of Selected Methodological Conditions on Dependent Measures Taken after Classroom Experimentation." Journal of Educational Psychology, 1966, 57, 350-358.

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Goodwin, William L. "Using Controlled Experimentation Effectively." PACE report, June-July 1969, 2-5.

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Goodwin, William L., and Lambert, Philip. "The Teacher Is Biased...At Best." Psychology in the Schools, 1965, 2, 169-171.

Goodwin, William L.; Joyce, Julianne; Abrams, Alan; Biaggio, Angela B.; and Biaggio, Luis I. "Note: Relationships between Matching Scales of the Cattell 16 Personality Factor Questionnaire and the High School Personality Questionnaire." Journal of Educational Measurement, 1965, 2, 220.

Klausmeier, Herbert J.; Cook, Doris M.; Goodwin, William L.; Tagatz, Glenn E.; and Pingel, Louis. Individualizing Instruction in Language Arts through Development and Research in R & I Units of Local Schools, 1965-1966. Technical Report No. 19, Research and Development Center for Cognitive Learning, Madison: University of Wisconsin, 1967.

Klausmeier, Herbert J.; Goodwin, William L.; Prasch, John; and Goodson, Max R. "Project Models: Maximizing Opportunities for Development and Experimentation in Learning in the Schools." Occasional Paper No. 3, Research and Development Center for Learning and Re-Education, Madison: University of Wisconsin, 1966.

Klausmeier, Herbert J.; Goodwin, William L.; and Ronda, Teckla. "Effects of Accelerating Bright, Older Elementary Pupils--A Second Follow-Up." Journal of Educational Psychology, 1968, 59, 53-58.

Lambert, Philip; Goodwin, William L.; and Roberts, Richard F. "A Comparison of Interaction Variables in Team and Self-Contained Classrooms." Psychology in the Schools, 1965, 2, 352-359.

Lambert, Philip; Goodwin, William L.; and Roberts, Richard F. "A Comparison of Pupil Achievement in Team and Self-Contained Organizations." Journal of Experimental Education, 1965, 33, 217-224.

Lambert, Philip; Goodwin, William L.; and Roberts, Richard F. "A Note on the Use of the Flanders Interaction Analysis." Journal of Educational Research, 1965, 58, 222-224.

Lambert, Philip; Goodwin, William L.; and Wiersma, William. "A Comparison of Pupil Adjustment in Team and Self-Contained Organizations." Journal of Educational Research, 1965, 58, 311-314.

Lambert, Philip; Goodwin, William L.; and Wiersma, William. "A Study of the Elementary School Team." Elementary School Journal, 1965, 66, 28-34.

Olton, Robert J.; Wardrop, James L.; Covington, Martin V.; Goodwin, William L.; Crutchfield, Richard S.; Klausmeier, Herbert J.; and Ronda, Teckla. *The Development of Productive Thinking Skills in Fifth-Grade Children.* Technical Report No. 34, Research and Development Center for Cognitive Learning, Madison: University of Wisconsin, 1967.

Staats, Arthur W.; Minke, Karl A.; Goodwin, William L.; and Landeen, Julie. *"Motivated Learning" Reading Treatment with Additional Subjects and Instructional Technicians.* Techincal Report No. 22, Research and Development Center for Cognitive Learning, Madison: University of Wisconsin, 1967.

Tagatz, Glenn E.; Otto, Wayne; Klausmeier, Herbert J.; Goodwin, William L.; and Cook, Doris M. "Effect of Three Methods of Instruction upon the Handwriting Performance of Third and Fourth Graders." *American Educational Research Journal*, 1968, *5*, 81-90.

Wardrop, James L.; Goodwin, William L.; *et al*. "The Development of Productive Thinking Skills in Fifth-Grade Children." *Journal of Experimental Education*, 1969, *37*, (4), 67-77.

Books and edited works:

Goodwin, William L. (Editor). *Bucknell Conference on Learning Problems of the Migrant Child.* Lewisburg, Pa.: Bucknell University, 1967.

Goodwin, William L., and Cieslak, Paul J. (Editors). *Bucknell Conference on Facilitating the Learning of the Migrant Child.* Lewisburg, Pa.: Bucknell University, 1968.

Klausmeier, Herbert J., and Goodwin, William L. *Learning and Human Abilities: Educational Psychology* (2nd Edition). New York: Harper and Row, 1966.

Lambert, Philip; Wiersma, William; Goodwin, William L.; and Roberts, Richard F. *Classroom Interaction, Pupil Achievement and Adjustment in Team Teaching as Compared with the Self-Contained Classroom,* Office of Education Cooperative Research Project Number 1391, Madison, Wisconsin: University of Wisconsin, 1964.

Papers presented:

Goodwin, William L. "The Effect on Achievement Test Results of Varying Conditions of Experimental Atmosphere, Notice of Test, Test Administration, and Test Scoring." Paper presented at the annual meeting of the American Educational Research Association, Chicago, Illinois, February, 1966.

Goodwin, William L., and Rubicam, Irvin R. "The Effects of Exemplary Models' Characteristics and Student Set on Resultant Student Preferential Attitudes." Paper presented at the annual meeting of the American Educational Research Association, Chicago, Illinois, February, 1968.

Goodwin, William L., and Sanders, James R. "The Effect of Selected Variables Upon Teacher's Expectation of Pupil Success." Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, California, February, 1969.

Lambert, Philip, and Goodwin, William L. "Interaction Variations in an Unstable Team Organization." Paper presented at the annual meeting of the American Educational Research Association, Chicago, Illinois, February, 1964.

Reviews:

Goodwin, William L. "Review of Four Measurement Books." Educational Leadership, 1969, 26, 829-830.

Goodwin, William L. "School Interest Inventory: Test Review." Journal of Educational Measurement, 1969, 6, 200-201.

References:

Professor Erwin Goldenstein, College of Education, University of Nebraska, Lincoln, Nebraska.

Professor Russell T. Gregg, Department of Educational Administration, University of Wisconsin, Madison, Wisconsin.

Professor Herbert J. Klausmeier, Research and Development Center for Cognitive Learning, University of Wisconsin, Madison, Wisconsin.

Professor Hugh McKeegan, Department of Education, Bucknell University, Lewisburg, Pennsylvania.

Professor Julian C. Stanley, Department of Education, The Johns Hopkins University, Baltimore, Maryland.

Wife's Name: Barbara Kay Goodwin

Birthplace: Lincoln, Nebraska

Children: Christina, eleven; Teresa, nine; Linda, eight; and Bill, four.

Kenneth D. Hopkins

Academic History:

A.B. (with honors), Pasadena College, 1956 (chemistry-math)
M.S., University of Southern California, 1959 (educ. psych.)
Ph.D., University of Southern California, 1961 (educ. measurement and statistics)
Postdoctoral Study, Laboratory of Experimental Design, University of Wisconsin, Summer Institute, 1965.

Vocational History:

Chemist, AG Chemical Company, 1955-58
Chemistry Teacher and Coach, San Marino Preparatory High School, 1957-58
Vocational Counselor, Veteran's Administration, USC Branch, 1958
Psychologist, Hudson School District, California, 1958-60
Visiting Lecturer, USC, 1959-60
Assistant Professor, University of Southern California, 1960-63
Associate Professor, University of Southern California, 1963-65
Visiting Professor, University of British Columbia, Summer, 1964
Associate Professor, University of Colorado, 1965-68
Director, Laboratory of Educational Research, University of Colorado, 1966-
Professor, University of Colorado, 1968-

Professional Associations and Activities:

California Educational Research and Guidance Award for excellence in research, 1961
Biometric Society
American Educational Research Association (Div. C and D); Member, Committee on Collating and Disseminating Information on Research Methodology
American Psychological Association (Div. 5 and 15), Fellow, Div. 5 (Measurement and Evaluation), 1968
Certified Psychologist, State of California
Phi Delta Lambda
Psychometric Society
American Men of Science, 1963-
Who's Who in American Education, 1968-
Who's Who in the West, 1963-
Editor, Review Section, Journal of Educational Measurement, 1965-68
Consulting editor, Journal of Experimental Education, 1969-72
Reader, Journal of Educational Measurement, 1969-
Research auditor, Philadelphia Public Schools, 1969-70
Research Consultant: Anaheim City School District, California, 1960-65; Orange County Schools, California, 1962-65; Jefferson County School District, Colorado, 1965-; Denver Public Schools, Colorado, 1965-; Boulder Valley School District, 1966-; El Paso County School District, 1967-; High School Geography Project, 1968-; Earth Sciences Curriculum Project, 1969-; Biological Sciences Curriculum Study, 1967-; JFK Child Development Center, University of Colorado Medical School, 1969-

Professional Associations and Activities (cont.):

Research Abstractor, Phi Delta Kappa, School Research Information Service, 1967-
Field Reader, U.S. Office of Education, 1967-
Research Training Institutes, Instructor: USOE Training Institute for State Department Personnel, University of Denver, 1965, 1967; Oklahoma Consortium on Research Development, 1967; AERA Presessions on Experimental Design and Analysis, New York, 1967; Lake Geneva, Wisconsin, 1968; Co-director, 1969, College Park, Maryland
Advisory Committee, Colorado State Department of Education, Research and Development Committee, 1967-
Adivsory Committee, Kellogg Community College Training Program, 1968-
Advisory Board Member, Children's Hospital, Los Angeles, Study of Phenylketonuria, 1962-

Papers Presented to Professional Groups:

American Psychological Association: 1968
American Educational Research Association: 1963 (2), 1964, 1967, 1968, 1969, 1970
National Council on Measurement in Education: 1963, 1965, 1967, 1968, 1970
California Association of School Psychologists and Psychometrists: 1963 (2), 1964
California Educational Research Association: 1965
Claremont Reading Conference: 1961
British Columbia School Principals' Association: 1964
International Reading Association: 1963, 1970
Southeastern Psychological Association: 1968
Tennessee Psychological Association: 1968

Publications:

Do Formal Readiness Programs in Kindergarten Help Children to Read Earlier or Later?, Curriculum Exchange, 2, 6, 1960.

The Diagnostic Use of WISC Subtest Patterns, California Journal of Educational Research, 12, 116-130, 1961.

Problems in Interpreting Standardized Reading Tests, Twenty-Fifth Yearbook, Claremont Reading Conference, Claremont University College, 137-139, 1961.

The Concurrent and Congruent Validities of the Wide Range Achievement Test, Educational and Psychological Measurement, 22, 791-793, 1962.

The Reliability and Predictive Validity of the Lee-Clark Reading Readiness Test, Journal of Developmental Reading, 6, 277-281, 1963.

Publications (cont.):

Two and Four-Year Constancy of CTMM Language and Non-Language IQ's, *Toward a Professional Identity in School Psychology*, California Association of School Psychologists and Psychometrists, 93-97, 1963.

The CASPP Professional Status Inventory: A Descriptive Survey, *Toward a Professional Identity in School Psychology*, California Association of School Psychologists and Psychometrists, 1963.

An Empirical Analysis and Critique of the Efficacy of the WISC in Diagnosing Organicity in Children of Normal Intelligence, *Journal of Genetic Psychology*, *105*, 163-172, September, 1964

Extrinsic Reliability: Estimating and Attenuating Variance from Response Styles, Chance and Other Irrelevant Sources, *Educational and Psychological Measurement*, *24*, 271-281, 1964.

Evaluating Pupil Achievement: A Critical Look at Provincial and Standardized Testing, *The British Columbia School Principals' Conference*, *Fourth*, 107-113, 1964.

Interindividual and Intraindividual Positional Preference Response Styles on Ability Tests, *Educational and Psychological Measurement*, *24*, 801-805, Winter, 1964.

Comparative Learning and Retention of Conventional and Instructional TV Methods, *AV Communication Review*, *13*, 27-37, Spring, 1965.

An Investigation of Theoretical and Empirical Chance Scores on Selected Standardized Group Tests, *California Journal of Educational Research*, *16*, 34-41, 1965.

Comparability of Scores on the Wide Range and the Gilmore Oral Reading Tests, *California Journal of Educational Research*, *16*, 54-57, 1965.

Differential Content Validity: The California Spelling Test, An Illustrative Example, *Educational and Psychological Measurement*, *25*, 413-419, 1965.

General Achievement Test, review in Buros, O. K. (Ed.), *The Sixth Mental Measurements Yearbook*. Highland Park, New Jersey: Gryphon Press, pp. 34-37, 1965.

Gates Advanced Primary Reading Test, review in Buros, O. K. (Ed.), *The Sixth Mental Measurements Yearbook*. Highland Park, New Jersey: Gryphon Press, pp. 1058-1060, 1965.

Principles of Psychological Measurement, by G. C. Hemstadter, review in *Educational and Psychological Measurement*, *25*, 627-630, 1965.

Publications (cont.):

An Empirical Comparison of Pupil Achievement and Other Variables in Graded and Ungraded Classes, American Educational Research Journal, 2, 207-215, November, 1965.

Mental Measurement of the Blind: The Validity of the Wechsler Intelligence Scale for Children, International Journal for Education of the Blind, 15, 65-73, 1966.

Academic Ability Test, review in Journal of Educational Measurement, 3, 81-83, 1966 (with D. C. Sander).

Standards for Educational and Psychological Tests and Manuals, review in Educational and Psychological Measurement, 26, 758-759, 1966.

A Practical Introduction to Measurement and Evaluation (2nd ed.) by H. H. Remmers, N. L. Gage, and J. F. Rummell, review in Educational and Psychological Measurement, 26, 1083-1085, 1966 (with W. A. Sease).

Anxiety, Physiologically and Psychologically Measured, and Its Consequence on Mental Test Performance (U.S. Office of Education Cooperative Research Program Project Number 5-10-324), Final Report, 1966.

TV vs. Teacher Administration of Standardized Tests: Comparability of Scores, Journal of Educational Measurement, 4, 35-40, 1967.

Methods of Predicting Grade One Reading Performance, Research and Guidance Newsletter, 5, 7-8, 1967.

Comparative Achievement with Departmentalized and Self-contained Classroom Organization, The Arithmetic Teacher, 14, 212-215, March, 1967 (with E. Price and A. Prescott).

IQ Constancy and the Blind Child, International Journal for the Education of the Blind, 16, 113-114, May, 1967 (with L. McGuire).

The Use of "None-of-These" versus Homogeneous Alternatives on Multiple-Choice Tests: Experimental Reliability and Validity Comparisons, Journal of Educational Measurement, 4, 52-58, Summer, 1967 (with M. Williamson).

Psychological Measurement and Prediction by P. Horst, review in Psychometrika, 32, 355-356, September, 1967 (with R. A. Smith).

A Schema for Proper Utilization of Multiple Comparisons in Research and A Case Study, American Educational Research Journal, 4, 407-412, November, 1967 (with R. A. Chadbourn).

Publications (cont.):

Research Training in Doctoral Programs in Education: Why, What, and for Whom?, *Research Paper No. 13*, Laboratory of Educational Research, University of Colorado, June 1968.

Anxiety, Physiologically and Psychologically Measured: Its Effects on Mental Test Performance, *Research Paper No. 15*, Laboratory of Educational Research, University of Colorado, September, 1968 (with A. C. Chambers and B. R. Hopkins).

Comparative Validities of Essay and Objective Tests, *Research Paper No. 20*, Laboratory of Educational Research, University of Colorado, October 1968 (with G. H. Bracht).

Establishing a Graduate Research Training Program and the Laboratory of Educational Research, Final Report, Grant No. OEG-8-8-961860-4003(058), U.S. Department of Health, Education, and Welfare, Office of Education, Bureau of Research, Washington, D.C., November 1968 (with G. V Glass).

Gates Advanced Primary Reading Tests, review in Oscar K. Buros (Ed.), *Reading Tests and Reviews*. Gryphon Press, pp. 296-297, 1968.

Five-Year Stability of Language and Non-Language IQs, *Research Paper No. 23*, Laboratory of Educational Research, University of Colorado, January 1969 (with M. Bibelheimer).

The Experimental Unit in Statistical Analysis, *Research Paper No. 28*, Laboratory of Educational Research, University of Colorado, March 1969 (with P. D. Peckham and G. V Glass).

Predicting Grade One Reading Performance: Intelligence vs. Reading Readiness Tests, *Journal of Experimental Education*, *37*, 31-33, Spring 1969 (with E. G. Sitkei).

Product Evaluation of New Design for Learning: A Junior High School Model, Year I, Laboratory of Educational Research, University of Colorado, mimeo, 51pp. (with G. H. Bracht).

Miller's Statistical Concepts and Applications, A Non-mathematical Explanation, review in *Educational and Psychological Measurement* (with G. H. Bracht), *29*, 221-223, 1969.

Regression and the Matching Fallacy in Quasi-Experimental Research, *Journal of Special Education*, *3*, 329-336, 1969.

The Experimental Unit in Statistical Analysis, *Journal of Special Education* (with P. D. Peckham and G. V Glass), *3*, 337-349, 1969.

Validity and Reliability, Consequences of Confidence Weighting, *Research Paper No. 35*, Laboratory of Educational Research, University of Colorado (with A. R. Hakstian and B. R. Hopkins), 1970.

Publications (cont.):

Educational and Psychological Measurement and Evaluation, Englewood Cliffs, N. J.: Prentice-Hall, 1971 (with J. C. Stanley) (in press).

Readings in Educational and Psychological Measurement and Evaluation. Englewood Cliffs, N.J.: Prentice-Hall, 1971 (with J. C. Stanley) (in press).

Stability of Reading Achievement: Grade One through Grade Eleven, *Research Paper No. 36*, Laboratory of Educational Research, University of Colorado (in preparation).

Ten Year Stability of Verbal and Non-Verbal Tests, *Research Paper No. 37*, Laboratory of Educational Research, University of Colorado (with G. H. Bracht) (in preparation).

Multiple Comparisons in Research: A Response to a Comment, *American Educational Research Journal*, *6*, 704-705, 1969.

Whitla's Handbook of Measurement and Assessment in Behavioral Sciences, review in *Psychometrika*, 1970 (with J. Collins) (in press).

The Communality of Essay and Objective Tests of Academic Achievement, *Educational and Psychological Measurement*, 1970 (with G. Bracht), *30*, 359-364, 1970.

Achievement in Departmentalized and Self-contained Classroom Organization, in Ashlock, R. B. and Herman, W. L. (Eds.), Current Research in Elementary School Mathematics, Macmillan, 1970 (with E. Price and A. Prescott).

Anxiety, Physiologically and Psychologically Measured: Its Effects on Mental Test Performance, *Psychology in the Schools*, 1971 (in press).

Five Year Stability of IQs from Langauge and Non-Language Group Tests (with M. Bibelheimer) *Child Development*, 1971 (in press).

Vita

BLAINE R. WORTHEN

PRESENT POSITION

Assistant Professor of Educational Psychology, and Co-director, Laboratory of Educational Research, School of Education, University of Colorado

PERSONAL DATA:

Birthdate:	October 10, 1936
Home Address and Telephone:	2805 Regis Drive Boulder, Colorado 80303 303-444-3575

Office Address and Telephone:

704 B, Denver Center	Laboratory of Educational Research
University of Colorado	106 Business Annex
14th and Arapahoe	University of Colorado
Denver, Colorado	Boulder, Colorado 80302
303-244-6081 Ext. 360	303-443-2211 Ext. 8339

EDUCATIONAL DATA:

B. S. -- University of Utah -- 1960
M. S. -- University of Utah -- 1965

Thesis: "Discovery vs. Expository Classroom Instruction: An Investigation of Teaching Mathematics in the Elementary School." Unpublished master's thesis, University of Utah, 1965.

Ph. D. -- The Ohio State University -- 1968

Dissertation: "The Impact of Research Assistantship Experience on the Subsequent Career Development of Educational Researchers." Unpublished doctoral dissertation, The Ohio State University, 1968.

HONORS RECEIVED:

1. University of Utah Normal Scholarship, 1959-60.
2. Received B. S. with "High Honors" -- elected to Phi Kappa Phi Honor Society, 1960.
3. Granted a "Doctoral Internship in Education" (national fellowship competition) at The Ohio State University, 1965-67.
4. Chosen as "Staff Associate" (national fellowship competition), University of Chicago, 1965. Declined, in order to accept offer at The Ohio State University.
5. Selected as the 1968 Ohio State University Flesher Fellow (Annual award to outstanding male graduate student in education at The Ohio State University), 1968.

PROFESSIONAL POSITIONS

1. Elementary school teacher, 1960-62.
2. Instructor, University of Utah Campus School, 1962-64.
3. Lecturer in education, College of Southern Utah, summer, 1964.
4. Instructor, College of Education, University of Utah, 1964-65 (half time).
5. Research Assistant, Department of Educational Psychology, University of Utah, 1964-65 (half time).
6. Doctoral Intern in Education, School of Education, The Ohio State University, 1965-67.
7. Research Associate, College of Education, The Ohio State University, 1967-68.
8. Associate Director, Evaluation Center, The Ohio State University, 1967-69.
9. Assistant Professor, College of Education, The Ohio State University, 1968-69.
10. Assistant Professor, School of Education, University of Colorado, 1969 - present.
11. Co-director, Laboratory of Educational Research, University of Colorado, 1969 - present.

CONTRACTS AND GRANTS RECEIVED AND PROJECTS DIRECTED:

Completed:

Director, National Evaluation Leadership Project, 1967-68. (Funding received with D. L. Stufflebeam) ESEA Title III, $48,000 (12 months).

Director, Strategies for Educational Change: A Dissemination Project, 1967-68. The Ohio State University Development Fund, $8,000 (12 months).

Director, O. S. U. -- Xenia Evaluation Project, 1968-69. (Funding received with D. L. Stufflebeam) ESEA Title III, $27,110 (12 months).

Currently Underway:

Director, National Study of Research Apprenticeship Experiences, 1968-70. Phi Delta Kappa International, $11,890 (18 months).

Director, AERA Study of Requirements and Procedures for Training Researchers and Research-Related Personnel, 1969-70. USOE Research Training Branch, $67,673 (18 months).

ACADEMIC TEACHING EXPERIENCE:

Workshop in Teaching Mathematics (College of Southern Utah - Summer, 1964).

Elementary Mathematics Sections: Elementary Education Practicum (University of Utah - Summer, 1964).

Workshop: Methods, Materials and Processes in Arithmetic (University of Utah - Autumn, 1964 - Winter, 1965).

Evaluation Functions and Methodology in Education (The Ohio State University - Spring, 1968, teamed with D. Stufflebeam).

Seminar in Educational Research (The Ohio State University - Winter, Summer, 1969).

Research Processes: Practicum in Educational Research (The Ohio State University - Winter, 1969, teamed with R. Bargar).

Experimental Design in Education (The Ohio State University - Winter, 1969, teamed with R. Hammond).

Elementary Statistical Methods (University of Colorado - Fall, 1969).

Evaluation Models and Procedures (University of Colorado - Fall, 1970).

Methods of Educational Research (University of Colorado - Spring, 1970).

Educational Research Internship (Supervisor), (University of Colorado - Autumn, 1970).

OTHER PROFESSIONAL EXPERIENCE:

1. Participant in National Science Foundation Summer Institute in Mathematics, University of Utah, June-August, 1963.

2. Conferee with University of Illinois Committee on School Mathematics (UICSM), January 13-18, 1964.

3. Discussant, Utah Council of Teachers of Mathematics, Modern Mathematics Conference for Pre-service Elementary Teachers, February 15, 1964

4. Guest Instructor (with S. M. Jencks), in video-taping a series of instructional TV programs, including discussions and classroom demonstrations in modern mathematics instruction. University of Utah Audio-Visual Aid Department, 1964-65.

5. Editor, Strategies for Educational Change (SEC) Newsletter, The Ohio State University, 1966-68.

6. Participant in Training Program in the Use of Management Information Systems in Educational Research and Development Activities, The Ohio State University, December, 1966.

7. Guest Editor, Theory Into Practice, June, 1967.

8. Consultant, ESEA Title III directors, State of Indiana (on evaluation), November 14, 1967.

9. Consultant, Saginaw City School System, Saginaw, Michigan (on evaluation design and process for regional supplementary service center, Title III, ESEA), October, 1967 - April, 1968.

10. Consultant, Kanawha County Schools, Charleston, West Virginia (on evaluation design and instrumentation for exemplary space-related science project, Title III, ESEA), December, 1967 - May, 1968.

11. Consultant, Mid-Continent Regional Educational Laboratory (on evaluation and research design), February 19-21, 1968.

12. Organizer and Senior Institute Instructor, National Science Teachers Association Institute on Evaluation for Science Program, Washington, D.C., March 24-27, 1968.

13. Lecturer, Latin American Institute, The Ohio State University (on measurement techniques), April, 1968.

14. Consultant, Educational Planning Mission to Ecuador, Agency for International Development (on designing a study to assess institutional capacity to implement educational plans), May 13-15, 1968.

OTHER PROFESSIONAL EXPERIENCE (CONTINUED):

15. Selected as participant in Second Annual Symposium, National Society of Professors of Educational Research, University of Colorado (focus on development of Instructional materials in R, D, and D). November 19-21, 1968.

16. Consultant, Appalachian Regional Laboratory (on conceptualizing an information system for process evaluation), December 13, 1968.

17. Consultant, Xenia City Schools, Xenia, Ohio (on developing a Title III, ESEA proposal), December, 1968 - January, 1969.

18. Lecturer, Defense Management Center, Wright-Patterson AFB, Ohio (series of lectures on measurement and evaluation), January - April, 1969.

19. Organizer, Symposium: An Analysis and Synthesis of Recently Completed Empirical Studies Related to Training Educational Research, Development, and Dissemination Personnel, The American Educational Research Association Annual Meeting, February 7, 1969.

20. Selected as discussant in Tenth Annual Phi Delta Kappa Symposium on Educational Research, Salt Lake City, Utah, April 10-12, 1969.

21. Organizer and Instructor, Institute on Evaluation, Elk Grove Training and Development Center, Illinois, March 3-6, 1969.

22. Selected as participant in AERA post-session on experimental design, College Park, Maryland, March 28 - April 1, 1969.

23. Consultant, Bartholomew Consolidated School District, Columbus, Indiana (on developing an evaluation design and monitoring system), June 19-20, 1969.

24. Lecturer, Illinois Program for the Gifted Summer Institute on Evaluation of Learning, July 28-30, 1969.

25. Lecturer, EPDA National Institutes on Evaluation, Columbus, Ohio (lectures on measurement techniques and use of simulation in training evaluators), July 7-11, 1969 and August 11-15, 1969.

26. 1969-70 Program Chairman, AERA Special Interest Group: Professors of Educational Research, July 1, 1969 - July 1, 1970.

27. Appointed as Advisory Editor for the Journal of Educational Measurement, September 20, 1969 - present.

28. Conducted an evaluation of the ESEA Title IV Graduate Research Training Program, Laboratory of Educational Research, University of Colorado, September 15 - October 31, 1969.

OTHER PROFESSIONAL EXPERIENCE (CONTINUED):

29. Consultant, Colorado State Department of Education EPDA programs in Special Education (on developing a design for formative and summative evaluation), October 22, November 25, and December 16, 1969.

30. Served (with Gene V Glass) as advisor to the Colorado State Department of Education, Division of Research and Development (on developing and testing a state assessment system), November 1 - present.

31. Lecturer, Graduate Seminar on Evaluation, The Ohio State University, Columbus, Ohio (lecture on evaluation and research designs), November 17, 1969.

32. Consultant, Colorado State Department of Education, Division of Research and Development (on developing an information collection and management system in response to mandate of House Bill 1129), November 4 and December 15, 1969.

33. Organized and conducted a Regional USOE Meeting on the Future of Title IV Graduate Research Training Programs, Boulder, Colorado, December 3, 1969.

34. Director, Institute on Writing Research Proposals, New York State Consortium on Research and Development, Buffalo, New York, December 5-6, 1969.

35. Selected as a member of a team to conduct a site visit and evaluation of the Oklahoma-Texas TTT Project, Durant, Oklahoma, December 21-22, 1969.

36. Appointed as Field Reader for the USOE Research Training Branch, January 2, 1970 - September 30, 1971.

37. Gave an address at the Colorado School of Mines professional development colloquium, Golden, Colorado (on classroom testing as an aid to improving instruction), January 15, 1970.

38. Conducted an Institute on Writing Objective-referenced Tests for the Colorado Department of Education Task Force on Assessment and Evaluation, January 29-31, 1970.

39. Evaluator, Measurement and Evaluation Center in Reading Education, Indiana University (asked to evaluate the utility of a training package designed to train evaluators of reading programs), February 27, 1970.

40. Organizer and Chairman, Symposium: The Research Assistantship as a Formal Component of Programs for Training Educational Researchers, The American Educational Research Association Annual Meeting, March 5, 1970.

OTHER PROFESSIONAL EXPERIENCE (CONTINUED):

41. Appointed as Chairman, AERA Task Force on Training Research and Research-related Personnel in Education, March 6, 1970 - present.

42. Evaluator, EPDA Teacher Preparation Program, Southeastern State College, Oklahoma, May 14-15, 1970.

43. Served as advisory referee for Review of Educational Research, 1970.

44. Selected as Test Reviewer for the Seventh Mental Measurement Yearbook, May, 1970.

45. Panelist, USOE National Center for Educational Research and Development, Research Training Branch review panel of proposals for materials development grants, Washington, D.C., June 15-16, 1970.

46. Evaluator, Eleventh Annual Phi Delta Kappa (International) Symposium on Research, Columbus, Ohio (charged with conducting an evaluation of the symposium and writing the report as a chapter for the PDK Eleventh Annual Yearbook), June 22-23, 1970.

47. Chairman, USOE Meeting of Directors of Graduate Training Programs, Washington, D.C. July 7, 1970.

48. Commissioned to prepare one of three conceptual frameworks to be presented at a USOE/Oregon State System of Higher Education "Review and Refinement Conference on Conceptual Frameworks for Educational Research and Related Activities," Lincoln City, Oregon, July 20-22, 1970. (paper prepared with Gene V Glass)

49. Selected to Advisory Committee on Evaluation Training, Center for the Study of Evaluation, UCLA, 1970 - present.

OTHER RELEVANT EXPERIENCE:

1. Served as missionary for Church of Jesus Christ of Latter Day Saints in Australia, 1956-58.

2. Personnel Manager, Continental Iambic Corporation (second position -- 30 hours weekly), 1960-62.

3. Stake (regional) Teacher Training Director, Church of Jesus Christ of Latter Day Saints: Mt. Jordan Stake (Utah), 1962-65; Columbus Stake (Ohio), 1968-69).

MEMBERSHIP IN PROFESSIONAL ASSOCIATIONS:

1. Local, State, and National Education Association, 1960-64.
2. Phi Delta Kappa, 1964 - present.
3. American Educational Research Association, 1965 - present.
4. Association for Supervision and Curriculum Development, 1966-69.

MEMBERSHIP IN PROFESSIONAL ASSOCIATIONS:

5. National Society of Professors of Educational Research, 1968 - present.

6. AERA Special Interest Group: Professors of Educational Research, 1969 - present.

7. American Psychological Association, 1969 - present.

8. National Council of Measurement in Education, 1969 - present.

PROFESSIONAL WRITINGS:

Books and Monographs

Clark, D. L. & Worthen, B. R. (Eds.) Preparing Research Personnel for Education. Bloomington, Indiana: Phi Delta Kappa, 1967.

Worthen, B. R. & Blanke, V. E. (Eds.) Strategies for Educational Change. New London, Connecticut: Crofts Publishers, Inc. (in press)

Chapters in Books and Monographs

Brownell, S. M. & Worthen, B. R. "New Roles for Public Schools in Training Educational Researchers," in Clark, D. L. & Worthen, B. R. (Eds.) Preparing Research Personnel for Education. Bloomington, Indiana: Phi Delta Kappa. 1967.

Worthen, B. R. "A Comparison of Discovery and Expository Sequencing in Elementary Mathematics Instruction," in Scandura, J. M. (Ed.) Research in Mathematics Education. National Council of Teachers of Mathematics. 1967.

Worthen, B. R., Sanders, J. R. & Rogers, W. T. "Evaluation and Meta-evaluation of the Eleventh Annual Phi Delta Kappa Research Symposium" Eleventh Annual Phi Delta Kappa Yearbook, Chicago, Illinois: Rand McNally. 1970.

Textual Materials

Worthen, B. R. & Hock, M. D. A Simulation Approach to Training Product Evaluators. Columbus, Ohio: Wadsworth Publishers, Inc. (in press).

Hock, M. D. & Worthen, B. R. A Simulation Approach to Training Program Evaluators. Columbus, Ohio: Wadsworth Publishers, Inc. (in press).

Articles Published in Professional Periodicals

Worthen, B. R. "The Innovation Dilemma," Strategies for Educational Change (SEC) Newsletter, Volume I, Number 10. November 1966.

Hopkins, J. E. & Worthen, B. R. "Change in Public Schools," Strategies for Educational Change (SEC) Newsletter. Vol. I, No. 12, May 1967.

PROFESSIONAL WRITINGS: (Continued)

Worthen, B. R. "The Evolution of Title III: A Study in Change," Theory Into Practice, Volume 5, Number 3. June 1967.

(Also reprinted as: "A Change in Title III?" Strategies for Educational Change (SEC) Newsletter, Volume II, Number 2. November 1967.

Worthen, B. R. "Discovery and Expository Task Presentation in Elementary Mathematics," Journal of Educational Psychology. Monograph Supplement, Volume 59, Number 1, Part 2. February 1968.

Worthen, B. R. "A Study of Discovery and Expository Presentation: Implications for Teaching," Journal of Teacher Education. Volume 19, Number 2. Summer, 1968.

Worthen, B. R. "Toward a Taxonomy of Evaluation Designs," Educational Technology. Volume 8, Number 15. August 15, 1968.

Worthen, B. R. & Roaden, A. L. "A Profile of AERA Members as Researchers," Educational Researcher, Volume 21, October 1970.

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CREDENTIALS AND REFERENCES ARE AVAILABLE FROM:

Educational Personnel Placement
The Ohio State University
1945 North High Street
Columbus, Ohio 43210

(Credentials that include more complete coverage of experience prior to 1965 are available from the University of Utah Placement Office, Salt Lake City, Utah 84112)

(Revised 11/20/70)

TECHNICAL PAPER NUMBER 3

APPENDIX B

PROGRESS REPORT AND EVALUATION OF THE GRADUATE RESEARCH TRAINING PROGRAM AND THE LABORATORY OF EDUCATIONAL RESEARCH

Progress Report and Evaluation of the Graduate Research Training Program and the Laboratory of Educational Research*

History

The Laboratory of Educational Research (LER) is the training vehicle for a graduate Research Training Program at the University of Colorado. It was established in September 1966 through two grants from the U.S. Office of Education under provisions of Title IV (Educational Research and Training) of the Elementary and Secondary Education Act of 1965 (P.L. 89-10). The grants totaling $62,420 for the first year (1966-67), [ ] for the second year (1967-68), and $61,240 for the third year (1968-69) permitted three necessarily interrelated moves: (1) strengthening the staff via funding of one full-time faculty position in research methodology, (2) increasing of curricular capability and training facilities needed [ ] preparing research specialists in education, and (3) providing support for eight Fellows ("Fellow" and "trainee" will be used interchangeably) pursuing the Ph.D. degree with specializaiion in either research methodology or a highly research-oriented program in a substantive area in education. The support for the strengthening of faculty and facilities resulted in the establishment of the Laboratory of Educational Research in September [ ], directed by Kenneth D. Hopkins, and in the addition of Gene V. Glass to the faculty of the School of Education as Co-Director of the LER and assistant professor of educational psychology in June, 1967. In August [ ] 1969, Blaine R. Worthen was added to the faculty as an assistant professor of educational psychology and Co-Director of the LER.

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*Retyped by Clearinghouse from poor copy. Omissions denoted by brackets.

The University of Colorado originally allocated 1,000 square feet for the Laboratory which has since been expanded to 1,180 square feet. The LER contains: (a) a modest library (numbering about 1,175 volumes) of relevant professional periodicals and reference books, (b) a statistics laboratory equipped with six automatic calculating machines, (c) two faculty offices and a secretarial area, (d) a desk and filing cabinet for each trainee, (e) a rental keypunch and 3M Copier, and (f) a seminar-consultation area.

A continuation grant of $52,400 for 1969-70 was awarded for the purpose of maintaining the training function of LER at its current level, viz., support for eight full-time fellowships.

In addition to the eight ESEA Fellows, membership in LER is open to any graduate student in education who meets the criteria for research potential as established in the original proposal: (1) an undergraduate GPA of at least 3.0, (2) a composite Graduate Record Examination (V & Q) score of 1200 (the upper ten per cent of college graduates in all fields); this criterion has been raised to 1250 for 1969-70, and (3) interest in a career in which educational research is highly relevant. Three graduate students (NDEA Fellows) elected to be a part of LER for the 1967-68 period; three were in the research training program for 1968-69; and two NDEA Fellows elected to be part of the LER during 1969-70. In addition, one research assistant supported by Univeriity of Colorado funds also elected to participate as an LER Fellow during 1969-70.

II. Financial Report (Graduate Training Program)

	1968-69		1969-70	
	Awarded[a] in grant	Expenditures during grant period	Awarded in grant	Prospective Expenditures
a. Student Support				
Stipends	$21,400	$21,400	$21,800	$21,600
Dependents	14,200	13,650	10,000	10,000
Travel	600	240	600	370
b. Institutional				
Allowance	20,000	20,000	20,000	20,000
c. Total	$56,200	$55,290	$52,400	$51,970

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[a] Grant period: 6-1-68 to 8-31-69 to include $2,200 undirectioned dependency allowance for 9-1-67 - 8-31-68 period.

III. Program Objectives

The objectives of the training program of the LER were stated in the original proposal which requested funds to establish the laboratory. The major objective of the LER and three instrumental objectives necessary to achieve the major objective was listed as follows:

A. To attract, train, and graduate persons with competence in, and dedication to, educational research that will enable them to stimulate and conduct research studies focused on important aspects of education.

   1. To develop and strengthen the specialized staffs in statistics, measurement, research design, and computer applications.

   2. To develop the curricular capability in order that the necessary and professional experience for specialization in educational research is provided.

   3. To provide the necessary relevant materials and equipment required for a comprehensive training program in educational research.

The evaluation reports for 1966-67 and 1967-68 show clearly that these objectives have been attained. However, as the LER training program has evolved, many additional implicit objectives have become apparent. In an attempt to explicate these objectives, the LER directors developed a comprehensive set of objectives for the reaction of LER Fellows and staff. The questionnaire which was used to elicit information on acceptance of the objectives appears below along with the results of its administration. Although the responses were analyzed separately for LER faculty and Fellows by year of entrance into the program, the reactions did not differ significantly across groups; therefore, the results were added and are reported as totals below.

QUESTIONNAIRE ON LER OBJECTIVES

No recent explicit statement of the objectives of LER is presently on record. Previous evaluations of the LER have made reference to the "objectives of the Graduate Research Training Program," suggesting the existence of a set of implicit objectives. Below is an attempt to explicate these objectives. The directors of LER have expressed concern that these objectives should reflect the objectives of the Fellows. Would you therefore respond to each objective by indicating with a check mark in the appropriate column, the degree to which you agree with it. In addition, if there are objectives which in your mind have been omitted, would you please add them to this list.

A. Ultimate Objectives

1. Place of work

Produce Ph.D.s in educational research who will, after graduation, work at:

Ranking		Strongly Agree 1	2	3	4	Strongly Disagree 5
1	a) Colleges or universities	22	1	0	0	0
7	b) Curriculum Development Projects	3	13	6	1	0
6	c) Educational Divisions of Private Companies: e.g., Xerox	0	12	5	5	1

Ranking		Strongly Agree 1	2	3	4	Strongly Disagree 5
9	d) Non-Research Position in State Dept. of Education	0	0	4	9	10
10	e) Non-Research Position in a Public School System	0	0	2	9	12
8	f) Publishing Houses	0	7	5	7	4
3	g) Regional Laboratory	10	13	0	0	0
2	h) Research and Development Center	14	8	1	0	0
4	i) Research Division of a Public School System	7	10	4	2	0
5	j) Research Division of a State Dept. of Education	5	13	5	0	0

Rank order - from "1" highest to "10" lowest, the above post-doctoral activities on the basis of your own preference. In the case of "ties" indicate so by assigning the same rank. Please place your rankings in the spaces to the left of each position.

B. Proximate Objectives

Provide the LER Fellows with the following instructional and professional experiences:

	Very Essential 1	2	3	4	Of No Value 5
a) Course work in statistics, research methods, evaluation, design, measurement, and computer utilization	23	0	0	0	0
b) Interdisciplinary course work in attendant areas	11	11	1	0	0
c) Flexibility, allowing for individual specialization in a particular area of educational research	15	6	2	0	0
d) Supervised internship experiences on projects that involve both basic and applied educational research, that include experiences with:					
(i) public schools	3	10	7	2	0
(ii) state departments of education		11	9	3	0
(iii) national curriculum projects	3	10	10		0
(iv) regional laboratories	7	11	4	1	0
(v) research and development labs	7	13	3	0	0

	Very Essential 1	2	3	4	Of No Value 5
e) Supervised consultation with clients (researchers, students working on their own research) on:					
(i) research design	21	2	0	0	0
(ii) selection of appropriate data analysis techniques	21	2	0	0	0
(iii) interpretation of data analyses	20	3	0	0	0
(iv) measurement and instrument development	17	5	0	0	0
(v) evaluation	16	6	1	0	0
(vi) computer use	17	4	2	0	0
f) Supervised teaching and other instructional activities (e.g., critique papers, conducting help sessions) of courses in research methods (broadly defined).	8	11	3	1	0
g) Publication of scholarly reviews	7	13	3	0	0
h) Production and publication of individual and group research projects	20	3	0	0	0
i) Attendance at meetings of educational research associations	9	14	0	0	0

II. Activities

Produce Ph.D.s in education research who will, after graduation:

	Strongly Agree 1	2	3	4	Strongly Disagree 5
a) Teach research-relevant courses at the graduate level	21	1	1	0	0
b) Teach research-relevant courses at the undergraduate level	7	13	3	0	0
c) Teach measurement and evaluation courses at the graduate level	18	4	1	0	0
d) Teach measurement and evaluation courses at the undergraduate level	6	11	6	0	0
e) Advise Masters and Doctoral students on research	21	2	0	0	0
f) Conduct basic educational research	20	3	0	0	0
g) Conduct applied educational research	19	4	0	0	0

86

	Strongly Agree 1	2	3	4	Strongly Disagree 5
h) Develop fundable research proposals	15	6	2	0	0
i) Consult with other faculty and/or education agencies on research	16	6	1	0	0
j) Publish the products of their own research	22	1	0	0	0
k) Assume an active role in educational research professional organizations	12	9	1	0	0
l) Continue their own training through such activities as research training workships, post-doctoral years, continued course work at universities	15	8	0	0	0
m) Train new education researchers (graduate Ph.D.s - working as their major adviser)	18	5	0	0	0
n) Continue research contributions throughout their professional careers	20	3	0	0	0
o) Assume a role in research administration	3	8	11	0	0

	Very Essential 1	2	3	4	Of No Value 5
p) Participate actively at meetings of educational research associations through presentation of papers, etc.	12	11	0	0	0
q) Seminars involving research specialists not associated with the lab	9	14	0	0	0
r) Meeting the requirements for a Ph.D. degree, as opposed to the Ed.D. degree	12	7	3	0	1

Additional data on LER Fellows' perceptions of the objectives of the laboratory were generated by four items in a questionnaire administered to all LER Fellows.[1] These items and responses to them are shown below.

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[1] Items from this questionnaire (hereafter referred to as Questionnaire A) appear throughout this report in sections to which they are most relevant. A copy of the entire instrument appears in Appendix A to this report.

	Strongly Agree 1	2	3	4	Strongly Disagree 5
1. The objectives of the program were clear to me.	7	5	0	0	0
2. The objectives of the program were not realistic.	0	0	0	6	6
3. The participants accepted the purposes of this program.	3	9	0	0	0
4. The objectives of the program were not the same as my objectives	0	2	0	6	4

Two items from a second questionnaire[2] administered to all LEP Fellows also yielded data relevant to certain of their postdoctoral goals as compared with their perception of the postdoctoral goals held for them by LEP faculty. These items and resultant rankings on them appear below.

16. Rank order--from "1" highest to "6" lowest--the following post-doctoral activities on the basis of your own preference:

(Average) Rank	Activity
4	Research in an R & D Center
3	Research in a Regional Laboratory
6	Director of research in a large city school system
2	Research and teaching in a small (less than 4,000) college or university
1	Research and teaching in a large (10,000+) university
5	Teaching only in a university

17. Rank order--from "1" highest to "6" lowest--the following post-doctoral activities in terms of what you feel the LEP Directors would like you to be doing when you finish:

(Average) Rank	Activity
4	Research in an R & D Center
3	Research in a Regional Laboratory
6	Director of research in a large city school system

---

[2] Items from this questionnaire (hereafter referred to as Questionnaire B) appear throughout this report in sections to which they are most relevant. A copy of the entire instrument appears in Appendix [illegible] to this report.

(Average) Rank	Activity
2	Research and teaching in a small (less than 4,000) college or university
1	Research and teaching in a large (10,000+) university
5	Teaching only in a university

It is apparent from the above data that the postdoctoral employment objectives of Fellows and those of the LER faculty, as perceived by the Fellows, correspond almost perfectly. The actual objectives of LER faculty also correspond almost completely with those of LER Fellows. Employment in a college or university setting is most valued, with regional laboratories and research and development centers being next in desirability as prospective employers. It should be noted that the three "place of work" objectives ranked lowest by the Fellows were those that were viewed as undesirable, hence non-objectives, by LER faculty, but were listed solely to obtain reactions of the trainees.

It is also clear that the LER Fellows accept the stated general objectives for the LER and view them as realistic and compatible with their own objectives, although there was slightly less inclination toward assuming a research administrative role or having a research internship in national curricular projects, state departments of education, or public school systems.

IV. Focus of Evaluation

In September of 1969 a brief response sheet was sent to each of the 12 LER Fellows in an attempt to identify program areas or activities most in need of evaluation. The results which appear below were helpful in focusing the evaluation activities reported in the following sections.

TO: Fellows of LEK
FROM: The Directors
DATE: 4 September 1969

We are attempting to determine the aspects of the program which concern you most so that we can concentrate on them in the annual evaluation. Please respond to the following items by indicating Satisfaction, Indifference, or Dissatisfaction with the way each is handled:

	(Check One)		
Area	S	I	D
1. Selection of Fellows	12	0	0
2. Internships	5	3	4
3. Course work	9	2	1
4. Money for stipends, travel to conventions, dissertation typing, etc.	6	2	2
5. Fellow's programs of independent or dissertation research	3	3	5
6. Physical facilities (space, desks, etc.)	5	4	3
7. Securing employment after graduation	3	6	1

V. Core Curriculum

Each Fellow is required to study a core of research training courses. Beyond this preparation, each trainee has the opportunity to elect additional courses relevant to further specialization. Each of the twelve trainees who was in the training program for the 1968-69 period was asked to evaluate the core courses which he has taken as a graduate student. The following written instructions were given to each Fellow.

> Your evaluation of the content of the core courses that you have completed together with your evaluation of the instructors of these courses will provide the stimulus and support for proposed revisions. Please be candid.
>
> Make your evaluation in terms of the objectives of the Graduate Research Training Program. Place your ratings to the right of the course number on the adjacent form.
>
> Rating Code for course content:
> A: essential
> B: highly desirable
> C: desirable, but other not-required courses would be equal in valu
> D: not as valuable as other possible electives
> E: of little or no value

Rating Code for effectiveness of presentation techniques used by by the instructor in communicating course content:

A: extremely effective
B: quite effective
C: adequate
D: somewhat ineffective
E: extremely ineffective

Your responses will be held in strict confidence and names will not be associated with information on these questionnaires. All responses will be processed by an LER Fellow.

The required courses are listed below along with the student evaluations. A summary of evaluations of elective courses is also included. It is important to bear in mind that these courses were evaluated with respect to their contribution to the objectives of the Graduate Research Training Program and not in relation to the students' own objectives or those of other students in the university.

Summary of Core Course Evaluation

	Frequencies of Rating									
	Course Rating					Instructor Rating				
Education	A	B	C	D	E	A	B	C	D	E
480-3 Elem. Stat. Methods	6		1			3	1	1	2	
503-2 Ad. Psych. Foundations	2	2	4			1	2	2	2	1
505-3 Inter. Stat. Methods	8					3	1	2	2	
511-3 Ad. Educ. Meas. & Eval.	10	1				9	2			
516-2 Ad. Soc. Found. of Educ.	1	4	2	2	3	2	5	3		2
591-3 Eval. of Sch. Sys. & Pro.	4	7	1			4	7	1		
600-2 Methods of Educ. Res.	6	3	1			5	4			
604-3 Exp. Des. & Anal. I	11					9	2			
605-3 Exp. Des. & Anal. II	7	3	1			6	4	1		
608-0 Intern. in Ed. Res. I	7	2	3							
609-0 Intern. in Ed. Res. II	7	2	2							
610-0 Intern. in Ed. Res. III	7	2	2							
611-0 Intern. in Ed. Res. IV	3	2	1							
700-4 Masters Thesis	3	1								
Psychology										
587-4 General Statistics I	4	5	2			1	3	3	3	1
588-4 General Statistics II	6	1	1	1		3	1		3	2
*6[illegible]4-2 Meth. in Ass. of Soc. Str.										
6[illegible]3-3 Multivariate Analysis	7	4					1	5	3	2

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* This course has not been offered during the period covered by this report.

	Frequencies of Rating									
	Course Rating					Instructor Rating				
	A	B	C	D	E	A	B	C	D	E
*** Mathematics**										
205-3 Math. for Soc. Sci. I										
206-3 Math. for Soc. Sci. II										
Computing Science										
551-3 Comp. Applic. in Beh. Sci.	1	2				1	2			

As was the case in previous years' reports, Fellows rated courses in experimental design and measurement very high. Oppositely, courses in social and psychological foundations of education are rated low. Instruction in the later two courses is likewise in need of improvement. Instructional problems in Psychology 588 (General Statistics II) indicated during the 1967-68 academic year have been ameliorated considerably, since the D and E ratings carry over from ratings of Fellows taking the course in 1967-68. This is also the case with Psychology 691 (Multivariate Analysis). It is noteworthy that in spite of the afore-mentioned instructional problems, the content was considered valuable.

Since time requirements have been lessened from 600 to 400 hours per year for the internships, their reported value has increased.

One item each from Questionnaires A and B also yielded trainees' perceptions of the value of the Core Curriculum. Responses to these items appear below and are self-explanatory.

8. Concept: IEP Core Curriculum

	1	2	3	4	5	6	7	
Too Little Freedom	0	1	0	11	0	0		
Too Much Math	0	0	0	5	2	[illegible]	1	Too Little Math
Too Theoretical	0	0	2	9	1	[illegible]	[illegible]	Too Applied
Poorly Designed	0	0	1	1	5	2	3	Well Designed

	Strongly Agree 1	2	3	4	Strongly Disagree 5
15. The research training core courses were relevant to the program's objectives.	6	5	1	0	0

---

* Fellows coming into the program during the past year have already had sufficient background in this area.

In addition to the core curriculum above, an integral, but non-credit requirement of the training program is the active association of each of the Fellows with LER. LER offers free consultative services to graduate students and faculty in the planning and conducting of educational research projects. A similar service is provided for school districts, curriculum projects, and other educational research related agencies and groups. The association with LER provides the Fellows with the invaluable experience of being confronted with actual problems in the design, measurement, and analysis of educational research. A concomitant service to graduate students, faculty, and educational groups is thereby provided.

All Fellows chose elective courses, which on the whole, were reported as beneficial. They included the following areas in declining order of frequency:

Area	Course Rating					Instructor Rating				
	A	B	C	D	E	A	B	C	D	E
Psychology	5	3	3	1		3	5	3	1	
Sem. in Design & Analysis	3	4	1			2	2	3	1	
Mathematics	4	3				3	1	3		1
Education	1	4	6			1	4	4	2	
Computer Science	3	2	1			2	4			
Misc.		1	1	1		1		1	1	

VI. Trainees

A. Selection of LER Fellows

Recruitment methods include the distribution of brochures (see next page) to leaders in the field of education who might have contact with prospective Fellows, to state departments of education, and several school districts. Approximately 2,000 copies of the brochure were mailed last year. However, referrals from persons in other institutions who are familiar with the program remain the single most important means of recruiting good prospects. Also, recommendations of prospective new Fellows from Fellows already in the LER are valuable.

FELLOWSHIPS IN EDUCATIONAL RESEARCH

Under provisions of Title IV of the Elementary and Secondary Education Act of 1965, the University of Colorado was awarded grants for the purpose of establishing a Laboratory of Educational Research (*LER*) to serve as a training vehicle for research specialists in education. Each September about four ESEA Title IV Fellowships are made available to students beginning work toward the Ph.D. In September 1969, *LER* will enter its fourth year of operation.

PROGRAM AND PERSONNEL

Under the direction of Dr. Kenneth D. Hopkins and Dr. Gene V Glass, *LER* provides educational research trainees with:

(1) a challenging interdisciplinary curriculum which affords both methodological and substantive depth leading to the Ph.D.;

(2) a flexible program allowing individual specialization in a particular area of educational research;

(3) continuous experience with actual research projects;

(4) an innovative internship program in which Fellows may obtain experience in the research departments of schools and state departments of education, in the Divisions of Research of Regional Educational Laboratories, or on curriculum development and evaluation projects.

The flexible core of the program includes academic work in the following areas; the names of faculty members primarily responsible for each area are as listed below

Statistics. Drs. Daniel E. Bailey--Psych. and Computing Science, G. V Glass--Educ., K. D. Hopkins--Educ., Edward J. Crothers--Psych.

Research Methodology. Drs. Harold M. Anderson--Educ., G. V Glass, K. D. Hopkins.

Computing Science: Drs. D. E. Bailey, David Hawkins--Phil. and Computing Science.

Experimental Design: Drs. G. V Glass, K. D. Hopkins.

Measurement and Evaluation: Drs. G. V Glass, K. D. Hopkins, Daryl L. Sander--Educ.

Multivariate Analysis. Drs. Desmond Cartwright--Psych., David R. Saunders--Psych.

Probability and Mathematical Statistics: Dr. Irving Weiss--Math.

Psychology: Drs. Lyle E. Bourne--Psych., D. Cartwright, Kenneth R. Hammond--Psych., O. J. Harvey--Psych., Richard Jessor--Psych., E. J. Crothers--Psych., Ronald Johnson--Psych.

Philosophy of Science: Dr. David Hawkins.

In addition the program includes a research practicum and approximately 30 semester hours of electives. Those who enter the program with a Master's degree can expect to obtain their Ph.D. in two years.

Graduates of the program will be prepared to assume a position in (1) colleges and universities, (2) research and development centers, (3) regional educational laboratories, (4) research departments of school districts, or (5) state departments of education. The first four graduates of *LER* took positions at the Univ. of Illinois--Urbana, Univ. of Washington--Seattle, Univ. of Southern California, and the Educational Developmental Laboratories.

FINANCIAL SUPPORT

Several three-year graduate fellowships are available with stipends of $2400, $2600, and $2800 for the first, second, and third years, respectively. Two-year post-Masters fellowships pay $2600 and $2800 for the two years. In addition, $500 is allowed for each dependent each year. A travel allowance of 8¢ per mile from the candidate's place of residence to the University of Colorado will be provided. The stipends are tax free and carry waiver of tuition and fees.

AWARDING OF FELLOWSHIPS

The primary criteria governing the selection of fellowship recipients are:

I. *High Academic Potential* as reflected in:
   (a) A minimum undergraduate grade point of 3.0 (on a 4.0 scale) with at least a 3.5 grade-point average on any graduate work completed. Transcripts of all academic work are required. *Persons with any undergraduate major are eligible to apply.*
   (b) A minimum combined score of 1250 on the Quantitative and Verbal Aptitude Sections (with a Quantitative score of not less than 625) of the Graduate Record Examination.

II. *Appropriate Background Experience* as reflected in:
   (a) A strong interdisciplinary preparation. College work in mathematics is essential unless GRE Quantitative score is indicative of excellent quantitative aptitude.
   (b) Academic work in the behavioral or social sciences.

III. *Interest in and Commitment to a Career in Educational Research* as reflected in:
   (a) The candidate's professional objectives.
   (b) Supporting letters of recommendation.

APPLICATION PROCEDURES

For application forms write to:

Laboratory of Educational Research
McKenna Building
University of Colorado
Boulder, Colorado 80302

Of the twelve Fellows presently in the LER, nine of them state that their first knowledge of the program was gained from persons at the University of Colorado or other institutions who knew of the program and recommended that they apply. Three Fellows discovered the program when they wrote to the Colorado Graduate School of Education for information about a program oriented toward educational research. The Graduate School sent them copies of the brochure and they then communicated with and applied to the LER.

It would appear then that the mass mailings of brochures do not produce very satisfactory results. Perhaps the brochures do initially interest individuals in the program, but the fact is that of the Fellows ultimately selected, none were recruited directly as a result of the mass brochure mailing method.

Recruiting efforts brought approximately sixty-five inquiries and requests for applications. This is fifteen more than the previous year. Requests for applications which were ultimately not submitted for consideration were received from the following locations:

Locations of Requests for Applications Which Were Not Subsequently Submitted

- Arizona
- California (2)
- Canada
- Colorado (3)
- Florida (2)
- Illinois (2)
- India
- Indiana
- Iowa
- North Carolina
- Ohio
- Oklahoma
- Pennsylvania
- Texas (3)
- Wisconsin

N 15

There were 37 applications submitted, which is approximately 17 more than the previous year. The locations of the 37 applications follow:

Locations of Submitted Applications

California (2)
Canada
Colorado (7)
Florida (4)
Illinois (6)
Kentucky
Massachusetts
Michigan
Minnesota (2)
Missouri
Nebraska
North Dakota
Ohio
Oregon
Taiwan
Texas
Utah (2)
Washington
Washington, D.C.
Wisconsin

It is interesting to note that along with the fact that there were almost twice as many completed applications in 1968-69 as in 1967-68, there were also twice as many locations from which people were applying. This would seem to indicate that the LER program is becoming more widely known.

Of the 37 submitted applications, three were selected as LER ESEA Fellows. One person received financial support from NDEA and one received support from the University of Colorado; both were accepted as LER members. The basic criteria used in selecting Fellows from applicants are stated in the LER brochure. The applicant in order to be considered for acceptance must have had a grade point average of 3.0 in undergraduate work and 3.5 in any graduate work completed. An he must have had a Grdauate Record Examination combined score of 1250 on the Quantitative and Verbal Aptitude Sections (with a Quantitative score of not less than 625). In addition, a strong background in mathematics was considered to be very important.

Other qualifications of the applicant which were considered were his age (the average age of Fellows this year is 25.2 as compared to 32.5 the previous year), the clarity with which he expressed his statement of objectives and reasons for wanting to be in the program, and the recommendations about him from persons known to be knowledgeable about the field of educational research. Whenever possible, the program director held an interview with the applicant.

Up until this time the directors of the program, who are the selection committee, have accepted only one woman as an ESEA LEP Fellow. The feeling has been that if a choice were to be made between two equally qualified applicants, one male and the other female, they would choose the male as the recipient of the ESEA Fellowship. This procedure is based generally on the rationale that, in the long run, a male would be the better investment because he would be more likely to complete the training program and then go on to be a productive educational researcher over the years.

However, the validity of this rationale is open to question. Jencks and Riesman[1] state some of the reasons why graduate schools are strongly prejudiced against women. First, the schools expect that women with graduate degrees will be married and have children and will not return to their professional work. Second, it is expected that more women than men will drop out of their degree programs and not put their education to use.

However, there is no body of evidence which either supports or refutes the above statements. There are, however, remarks which can be made to help round out the picture. Jencks and Riesman state "The professions may have very narrow assumptions about what kinds of work are valuable and what kinds are not." Also, "The woman who drops out and does nothing tangible with her education often makes an intangible contribution, both to society and to the graduate school in which she is briefly enrolled."

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[1] Christopher Jencks and David Riesman, *The Academic Revolution*, 1968, Doubleday and Company, New York.

The suggestion here is that those in charge of the selections of IER Fellows seek out evidence for and against their present rationale of prejudice against females, and either maintain the status quo if it is reasonable or revise the selection procedures to permit females to compete on an equal footing with males.

B. Enrollment (All for a Full Year)

1. Total persons enrolled in training program, 1968-69

Third Year

Ralph Hakstian (ESEA)
Masahito Okada (ESEA)
Arthur White (ESEA)
Glenn Bracht (NDEA)
Scott Harrington (NDEA)

Second Year

Daniel Bauman (ESEA)
James Collins (ESEA)
Stephen Jurs (ESEA)
Robert Mendro (ESEA)
James Sanders (ESEA)
Jon Morris (NDEA)

First Year

Nancy Burton (University support)

2. Total persons enrolled in training program, 1969-70

Third Year

Daniel Bauman (ESEA)
James Collins (ESEA)
Stephen Jurs (ESEA)

Robert Mendro (ESEA)

James Sanders (ESEA)

Jon Morris (NDEA)

Second Year

Arlen Gullickson (ESEA)

William Tood Rogers (ESEA)

Rory Kemer (University)

Nancy Burton (University)

First Year

Robert Ahrens (ESEA)

Susan Oldefendt (NDEA)

3. Total persons enrolled in trainnng program, 1970-71 (estimated)

Third Year

Arlen Gullickson (ESEA)

William Todd Rogers (ESEA)

Nancy Burton (University)

Rory Kemer (University)

Second Year

Robert Ahrens (ESEA)

Susan Oldefendt (NDEA)

First Year

Six new Fellows (5 ESEA, 1 NDEA)

C. Profile of Present Trainees (1969-70)

Fellow	Expected Year of Degree	Age	Undergraduate GPA	Undergraduate Institution	Undergraduate Major	Graduate Record Exam V	Graduate Record Exam Q
1	1972	26	2.97	Concordia Col.	Math	620	700
2	1970	36	2.37	Indiana U.	Chem.	700	790
3	1971	25	3.23	Knox Col.	Phil.	800	610
4	1970	27	2.94	DePaux U.	Math.	590	740
5	1971	28	2.74	U. of No. Iowa	Math	600	680
6	1970	24	3.01	No. Ill. U.	Math.	590	740
7	1970	24	3.09	No. Ill. U.	Math.	630	760
8	1970	28	3.40	Ill. Wesleyan	Math.	590	610
9	1972	24	3.29	St. Olaf Col.	Engl.	620	640
10	1971	22	*	Princeton U.	Math.	695	720
11	1971	28	*	U. Brit. Col. Canada	Math. Ed.	560	760
12	1970	24	2.30	Bucknell U.	Chem.	540	710
Means		26.4	2.93			628	705

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* Undergraduate averages not calculated on a comparable scale.

Seven continuing Fellows are included in the 1969-70 program. The following list includes the title of their dissertations and their publications and research projects completed during 1968-69.

Daniel J. Bauman

Doctoral Dissertation

Change in Expectations in Relation to Change in Cognitive Knowledge (in progress)

Publications

"The Effects of the Position of an 'Organizer' on Learning Meaningful Verbal Material" (with Gene V Glass and Scott A. Harrington), *Research Paper No. 24*, Laboratory of Educational Research, University of Colorado, September 1968.

"A Computer Program for Data Summarization," *Educational and Psychological Measurement* (in press).

Nancy Burton

Publications

Author's Guide and Style Manual for the Review of Educational Research (with Gene V Glass). American Educational Research Association, Boulder: Laboratory of Educational Research, University of Colorado, 1968 (Offset).

"Course Evaluation Inventory," Boulder: Laboratory of Educational Research, University of Colorado, 1968 (Offset).

James R. Collins

Doctoral Dissertation

Jackknifing Generalizability (in progress)

Publications

"Review of Baggaley's *Mathematics for Introductory Statistics, A Programmed Review*," *Educational and Psychological Measurement*, *29*, 1969, 722-725.

"Geometric Proof of the Restriction of the Possible Values of r_{xy} when r_{xz} and r_{yz} are Fixed," *Educational and Psychological Measurement* (in press)

Research in Progress

Sources of Variation in Multiple Test Performance (with David E. Wiley and Gene V Glass)

Comparison of Methods for Testing Non-independent Correlation Coefficients (with K. D. Hopkins)

Stephen G. Jurs

Doctoral Dissertation

Causal Inference in the Input-Output Model Applied to Secondary Schools (in progress)

Publications

Mastery Test Items for Courses in Educational Research Methods (with Gene V Glass and James R. Sanders). American Educational Research Association, Boulder: Laboratory of Educational Research, University of Colorado, 1969 (Offset).

Research in Progress

Experimental Mortality

Robert L. Mendro

Doctoral Dissertation

A Monte Carlo Study of Multiple Comparison Procedures after Analysis of Covariance (in progress)

Publications

"Review of *Inferential Statistics in the Behavioral Sciences* by Sheldon G. Levy," *Educational and Psychological Measurement* (in press).

Jon R. Morris

Doctoral Dissertation

A Study of Models of Student Flow in University Structure (in progress)

James R. Sanders

Doctoral Dissertation

Short Term and Long Term Retention Effects of Adjunct Questions in Audio Discourse: An Extension of Research on Mathemagenics (in progress)

Publications

Mastery Test Items for Courses in Educational Research Methods (with Gene V Glass and Stephen G. Jurs). American Educational Research Association, Boulder: Laboratory of Educational Research, University of Colorado, 1969 (Offset).

"An Exploratory Study of the Effect of Selected Variables upon Teacher Expectation of Pupil Success" (with W. L. Goodwin). Paper read at AERA Annual Convention, February 7, 1969.

Research in Progress

Consequences of Failure to Meet the Assumptions Underlying the Analysis of Variance (with Gene V. Glass)

D. Profile of Graduates from LER Program

Perhaps the most valid evaluation of the success of a research training program lies in assessing the subsequent research involvement and productivity of its graduates. Nine Fellows have graduated from the LER; four in 1968, five in 1969. In this section, educational data and indicators of academic progress are included for the 1968-69 graduates, while present position, title, and research publications are included for all graduates

1. Biographical and Educational Data

The following biographical and educational data are descriptive of the five Fellows who graduated during the 1968-69 period.

			Undergraduate			Graduate Record Exam	
Fellow	Yr.	Age	GPA	Institution	Major	V	Q
13 *ab	3	30	3.53	Concordia Col. Nebraska	Eng.	490	750
14 ab	3	27	3.50	U. of Brit. Col. Canada	Eng.;Psy.	650	750
15 a*	3	28	3.00	Kansas U	Hist.	610	680
16 ab	2	37	2.45	U. of Colo.	Chem.	610	720
17 ab	2	34	3.23	Colo. St. Col.	Phy. Sci.	510	730
Means		31.2	3.14			574	726

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*NDEA Fellow

[a] Fellow completed program in August, 1969.

[b] Fellow received degree in August, 1969.

2. Academic Progress--1968-69

The following table shows the hours of academic credit and grade point averages earned during 1968-69 by the five Fellows who graduated from the Laboratory of Educational Research.

	Semester Hours 1968-69					G.P.A. 1968-69			Cumulative
Fellow	Educ.	Psych.	Comp. Sci.	Other	Total	Educ.	Other	Over-all	G.P.A. U. of Colo.
13 a*	2	2	-	3	7	4.00	4.00	4.00	3.80
14 a	-	-	-	3	3	-	4.00	4.00	4.00
15 a*	5	3	-	-	8	3.00	2.00	2.62	3.60
16 a	4	9	-	-	13	4.00	3.67	3.77	3.85
17 a	3	-	-	-	3	4.00	-	4.00	3.50
Means	2.8	2.8	-	1.2	6.8	3.64	3.55	3.59	3.75

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[a] These persons each completed a Ph.D. thesis, which carries not official semester hours credit.
*NDEA Fellow

The above data indicate outstanding academic achievement. The mean grade point average for all work during the 1968-69 year was 3.59. The graduating Fellows averaged 7 hours of coursework. Graduating Fellows served internships during each year and wrote dissertations, both of which carried no official hours of academic credit. Almost sixty (59) per cent of the hours taken during the year was outside the major department, illustrating the interdisciplinary nature of the program.

The following list includes the present positions, research, publications, projects, and involvement of the previous LER graduates.

Glenn H. Bracht

Position

Assistant Professor, Guidance and Educational Psychology, Faculty of Education, University of Southern Illinois

Teaching Assignment 1969-70

Introduction to Statistical Methods
Intermediate Statistical Methods
Advanced Statistical Methods
Seminar in Experimental Design

Summary of Professional Time 1969-70

Teaching	45%	Other Administration	5%
Research	50%	Other	0%
Research Administration	0%		

Doctoral Dissertation

The Relationship of Treatment Tasks, Personological Variables, and Dependent Variables to Aptitude-Treatment Interactions (August, 1969)

Publications

The Comparative Values of Objective and Essay Testing in Undergraduate Education: Implications for Valid Assessment of Instruction. Unpublished M.A. Thesis, University of Colorado, 1967. 101 pp.

"Objective and Essay Tests: Do They Measure Different Abilities?" (with Kenneth D. Hopkins). Paper presented at a Joint Session of the Annual Meetings of the American Educational Research Association and the National Council on Measurement in Education, Chicago, February 8-10, 1968. 14 pp.

"The External Validity of Comparative Experiments in Education and the Social Sciences," (with Gene V Glass) *Research Paper No. 3*, Laboratory of Educational Research, University of Colorado, October 1967, 40pp.

"Comparative Validities of Essay and Objective Tests," (with K. D. Hopkins) *Research Paper No. 20*, Laboratory of Educational Research, University of Colorado, October 1968. 25 pp.

"The External Validity of Experiments," (with Gene V Glass) *American Educational Research Journal*, 5, 437-474, November 1968.

"An Evaluation of the Educational Program of a High School Using a Modular Schedule: A Follow-up Study," (with Gerald Speckhard) Research Paper No. 19, Laboratory of Educational Research, University of Colorado, October 1968. 41 pp.

"Review of Postlethwaite's School Organization and Student Achievement: A Study Based on Achievement in Mathematics in Twelve Countries," The Educational Forum, 33, 260-261, January 1969.

"Review of Miller's Statistical Concepts and Applications, A Non-Mathematical Explanation," (with Kenneth D. Hopkins) Educational and Psychological Measurement, 29, 221-223, Spring 1969.

Product Evaluation of New Design for Learning: A Junior High School Model, Year I" (with Kenneth D. Hopkins), Laboratory of Educational Research, Univ. of Colo., December 1968. 51 pp.

"Ten-Year IQ Stability on Verbal and Non-Verbal Tests." Paper presented at AERA, February 1969. 22 pp. (with Kenneth D. Hopkins).

C. Ann Brickner

Position

Evaluation Director, Educational Development Laboratories, McGraw-Hill Publishing Company (August 1968)

Summary of Professional Time 1969-70

Teaching	0%	Other Administration	0%
Research	50%	Other (Public Relations)	20%
Research Administration	30%		

Doctoral Dissertation

Experimental Analysis of Auditory Discrimination Skills in the Developmental Structure of Pre-School Children

Publications

"Effects of Operant Conditioning on Frequency of Polysyllabic Words and Speed of Response," (with A. Ralph Hakstian) Psychonomic Science, 13, 207-208, 1968.

"Operant Conditioning of Polysyllabic Words," (with A. Ralph Hakstian) Research Paper No. 11, Laboratory of Educational Research, University of Colorado, June 1968.

"Experimental Analysis of Auditory Discrimination Skills in the Developmental Structure of Pre-School Children," Research Paper No. 17, Laboratory of Educational Research, University of Colorado, September 1968.

"Summative Evaluation of Listen Look Learn Cycles R-40," Research and Information Bulletin No. 12, EDL, Huntington, N.Y., November 1968.

"Follow-Up Study of LLL First Year Students Who Used Traditional Basal Programs in Second Year," *Research and Information Report No. 1*, EDL, Huntington, New York, February 1969.

"Reading Rates Attained by First Year Listen Look Learn Students," *Research and Information Report No. 2*, EDL, Huntington, New York, February 1969.

"Listen Look Learn Evaluation Manual," EDL, Huntington, New York, February 1969.

"Evaluation of Listen Look Learn Cycles R-40 in Corrective and Remedial Installations, 1967-68," *Research and Information Bulletin No. 14*, EDL, Huntington, New York, March 1969.

"An Inner-City Project Developed by EDL, A Division of McGraw-Hill, for New York City Decentralized School Districts," EDL, Huntington, New York, June 1969. (Mimeo)

"Analysis of Eye-Movement Recordings for a Sample of Secondary Students in a Private Tutorial Installation," EDL, Huntington, New York, June 1969. (Mimeo)

"Preliminary Report on Use of the Listen Look Learn System with an English-as-a-Second Language Sample," EDL, Huntington, New York, July 1969. (Mimeo)

"A Proposal for the Texarkana Dropout Prevention Program," EDL, Huntington, New York, August 1969. (Mimeo)

"Learning 100 System Use with Project 100,000 Inductees, Fort Polk Training Center," *Research and Information Report No. 3*, EDL, Huntington, New York, September 1969.

Russell A. Chadbourn

Position

Assistant Professor, Educational Psychology, Faculty of Education, University of Illinois

Teaching Assignment 1969-70

Intermediate Statistics
Seminar in Research Methods

Summary of Professional Time 1969-70

Teaching	80%	Other Administration	15%
Research	5%	Other	0%
Research Administration	0%		

Doctoral Dissertation

Maximization Procedures for Generalizability Studies (January 1969)

Publications

"A Schema for Proper Utilization of Multiple Comparisons in Research and a Case Study," (with Kenneth D. Hopkins) American Educational Research Journal, 4, November 1967, 407-412.

"A Critique of Current Research Practices in Mathematics Education," Research Paper No. 7, Laboratory of Educational Research, University of Colorado, December 1967.

"Maximization Procedures for Generalizability Studies," Research Paper No. 25, Laboratory of Educational Research, University of Colorado, January 1969. 191 pp.

"Review of Neimark and Estes' Stimulus Sampling Theory," Educational and Psychological Measurement, 28, 638-640, 1968.

"Maximization of Generalizability under Cost Constraints." Paper read at AERA annual convention, February 1969.

"Multiple Comparison in Research: A Response to a Comment," American Educational Research Journal (in press) (with K. K. Hopkins).

A. Ralph Hakstian

Position

Assistant Professor, School of Education, University of Massachusetts

Teaching Assignment 1969-70

Introduction to Factor Analysis
Test Theory
Introduction to Multivariate Analysis
Intermediate Statistical Methods

Summary of Professional Time 1969-70

Teaching	33%	Other administration		0%
Research	47%	Other	(1) advising	15%
Research Administration	0%		(2) committee work	5%

Doctoral Dissertation

Methods of Oblique Transformation (August, 1969)

Publications

"Operant Conditioning of Polysyllabic Words," (with C. Ann Brickner) Research Paper No. 11, Laboratory of Educational Research, University of Colorado, June 1968.

"Review of J. B. Chassan, Research Design in Clinical Psychology and Psychiatry," (with Gene V. Glass) Educational and Psychological Measurement, 28, 621-623, 1968.

"Review of Plutchik, Foundations of Experimental Research," Educational and Psychological Measurement, 28, 972-974, 1968.

"Review of the Pimsleur Foreign Language Proficiency Tests," Journal of Educational Measurement, 6, 44-46, 1969.

"Effects of Operant Conditioning on Frequency of Polysyllabic Words and Speed of Response," (with C. Ann Brickner) Psychonomic Science, 13, 207-208, 1968.

"Measures of Association in Comparative Experiments: Their Development and Interpretation," (with Gene V Glass) Research Paper No. 14, Laboratory of Educational Research, University of Colorado, September 1968. Also in AERJ, 6, 403-414, 1969, and paper given at AERA annual meeting, 1969.

"A Comparison of the Effects on Study Methods and Test Performance of Objective, Essay and Combined Examinations," Research Paper No. 21, Laboratory of Educational Research, University of Colorado, September 1968; Paper read at AERA annual convention, February 1969.

Research in Progress

Validity and Reliability concomitants of Confidence Weighting

A Program for Orthogonal Rotation Using the General "Orthomax" Criterion.

Scott A. Harrington

Position

Assistant Professor, Guidance and Counseling, Faculty of Education, University of Nebraska at Omaha

Teaching Assignment 1969-70

Statistical Methods
Group Techniques in Guidance
Practicum in Guidance and Counseling

Summary of Professional Time 1969-70

Teaching	75%	Other Administration	0%
Research	25%	Other	0%
Research Administration	0%		

Doctoral Dissertation

The Effects of Basic Encounter Experience With Prospective Counselors On: Sensitivity to Non-Verbal Communication of Feeling, Acceptance of Self, and Acceptance of Others (in progress).

Publications

"Sequencing 'Organizers' in Meaningful Verbal Learning," Research Paper No. 10, Laboratory of Educational Research, University of Colorado, April 1968.

"Review of 'Survey of Study Habits and Attitudes,'" (with A. Roark) Journal of Educational Measurement (in press).

Masahito Okada

Position

Staff, Research and Development, Product Department, Southwest Regional Laboratory

Summary of Professional Time 1969-70

Teaching	0%	Other Administration	0%
Research	25%	Other (1) Product Development	50%
Research Administration	25%	(a) K-3 Communication Skills	
		(b) Problem Solving in the Social Sciences	

Doctoral Dissertation

The Comprehension of Textual Information Presented Through Single and Multiple-Sense Modalities (August, 1969)

Publications

"An Analysis of Delacato's Experimental Evidence," (with Gene V. Glass) Pediatrics (in press).

Research in Progress

Thematic Preference Study
Object Identification Study

Percy D. Peckham

Position

Assistant Professor, Educational Psychology, Faculty of Education, University of Washington

Teaching Assignment 1969-70

Measurement and Evaluation (undergraduate)
Basic Educational Statistics
Research Methods
Computer Utilization
Research Design and Analysis

Summary of Professional Time 1969-70

Teaching	67%	Other Administration	0%
Research	33%	Other	0%
Research Administration	0%		

Publications

"Review of Understanding Educational Research by D. Van Dalen" (with Kenneth D. Hopkins), Educational and Psychological Measurement, 27, 539-541, Summer 1967.

"An Investigation of the Effect of Non-Homogeneity of Regression Slopes Upon the F-Test of Analysis of Covariance," Research Paper No. 16, Laboratory of Educational Research, University of Colorado, September 1968.

"Review of Sax's Empirical Foundations of Educational Research," Educational and Psychological Measurement, 29, 544-546, 1969.

"The Experimental Unit in Statistical Analysis: Comparative Experiments with Intact Groups," (with Gene V Glass and Kenneth D. Hopkins) Research Paper No. 28, Laboratory of Educational Research, Boulder, Colorado, March, 1969.

"The Experimental Unit in Statistical Analysis," Journal of Special Education (in press).

Robert A. Smith

Position

Assistant Professor, School of Education, University of Southern California

Teaching Assignment 1969-70

Introductory Statistics
Intermediate Statistics
Experimental Design
Computer Applications in Research

Summary of Professional Time 1969-70

Teaching	80%	Other Administration	0%
Research	10%	Other	0%
Research Administration	10%		

Dissertation

An Empirical Analysis of the Effect of Unequal Sample Size on the Tukey Studentized Range Technique (August, 1968)

Publications

"An Empirical Analysis of the Effect of Unequal Sample Size on the Tukey Studentized Range Technique," Research Paper No. 18, Laboratory of Educational Research, University of Colorado, September 1968.

Review of Wisconsin Contemporary Test of Elementary Mathematics, Journal of Educational Measurement (in press).

"Computer Procedure for the Analysis of Variance in Three-Factor Experiment with Repeated Measures in One of the Three Factors," (with Young B. Lee and William B. Michael) *Educational and Psychological Measurement*, *29*, 715-716, Autumn 1969.

"Review of Horst's *Psychological Measurement and Prediction*." *Psychometrika*, *32*, 355-356, 1967.

Research in Progress

Review of *La Simulation du Comportement Humain* (*The Simulation of Human Behavior*) for *Educational and Psychological Measurement*

The Effect of Unequal Group Sizes on Tukey's HSD Procedure (under consideration by *Psychometrika*).

Negotiation Attitude Inventory - a revised instrument being developed (in conjunction with Dr. Frank Fox, Educational Psychology Department of University of Southern California) for the California Teachers Association-Southern Section.

Achievement Prediction of Students in an extended Mathematic Sequence-a project funded by the State of California in conjunction with Dr. Paul White of Mathematics Department, University of Southern California.

Arthur L. White

Position

Assistant Professor, Science and Mathematics Department, Faculty of Education, Ohio State University

Teaching Assignment 1969-70

Practicum for Methods of Teaching the Physical Sciences in Secondary Schools
Supervision of Student Teachers

Summary of Professional Time 1969-70

Teaching	25%	Other Administration	0%
Research	5%	Other 1. Advising	15%
Research Administration	0%	2. Student Teacher Supervision	50%
		3. Curriculum Work	5%

Doctoral Dissertation

The Development of Models to Explain the Relation of Important Variables to Laboratory Strategies (August 1969)

Research in Progress

Problem booklet to accompany statistics text by Gene V. Glass

VII. Internships, Training Experiences, and Services of the LER

A. Services of the LER

The Laboratory of Educational Research serves agencies and organizations outside of the University of Colorado as well as within it. Service takes the form of internship activity (LER Fellows working on research projects with an educational agency without remuneration) and consultation on matters of research design, analysis, and evaluation. The following agencies and projects outside of the University of Colorado were served during the 1968-69 academic year. Several internships were involved in evaluating Title I and III projects.

1. Biological Sciences Curriculum Study
2. Golden Public Schools (Golden, Colorado)
3. Colorado Springs School District (Colorado Springs, Colo.)
4. Louisville High School (Louisville, Colorado)
5. Earth Science Curriculum Project
6. Colorado State Department of Education
7. Social Science Education Consortium
8. Clearing House (Boulder, Colorado)
9. Nebraska State Department of Education
10. Boulder Valley (Colorado) Vocational Education Unit
11. Sacred Heart High School (Boulder, Colorado)
12. McClelland Foundation (Pueblo, Colorado)
13. Department of Speech Pathology (Queens College, New York)
14. Department of Educational Psychology (Temple University)
15. Human Factors Research Lab. (Colo. State University, Fort Collins)
16. Northglenn Junior High School (Denver, Colorado)
17. Bureau of Educational Research (Denver University)
18. Denver Metropolitan YMCA

19. El Paso School District (Colorado Springs)
20. Law School (Denver University)
21. School of Education (Bucknell University)
22. School of Education (Brigham Young University)
23. American Educational Research Association Post-Session on experimental design and analysis

The following departments and units within the University of Colorado used the services of LER for consultation on research design and analysis. The number in parentheses is the number of individuals in that department who used the services.

1. School of Education (90; 75 students, 15 faculty)
2. Department of Physical Education (27)
3. School of Business (13)
4. Department of Psychology (5; 2 students, 3 faculty)
5. Department of Speech (4)
6. Department of Economics (2)
7. Department of Anthropology (1)
8. Department of Fine Arts (1)
9. School of Nursing (1)
10. Department of Audiology (1)
11. Center for Study of Intellective Behavior (1)
12. University of Colorado Personnel Services (4)
13. University of Colorado Counseling Center
14. University of Colorado Dormitory Study
15. Institute for Behavioral Science
16. Norlin Library
17. University of Colorado Medical School (Denver)

Data were gathered pertaining to the role and services of the LER as viewed by other faculty members in the School of Education. A questionnaire was distributed to 41 faculty members of the School of Education; 28 of the questionnaires were returned in usable form, 21 from faculty on the Boulder Campus and 7 from the Denver Center. A majority of the non-respondents are likely to be individuals who had not utilized the LER and probably did not feel qualified to respond on the basis of a lack of adequate information. Question No. 1 supports this view since twelve respondents reported personal use of the lab, while 15 is the total number of users appearing on LER records. Certainly one should view the 28 respondents as not necessarily representative of the non-respondents. The questionnaire and responses are shown below.

Questionnaire on the Laboratory of Educational Research

We are gathering information to evaluate the operations of the Laboratory of Educational Research during the 1968-1969 academic year (including summer sessions) and in order to plan for the current year. Your responses to the following questions will be appreciated. If you are new on the faculty, undoubtedly you will not be able to respond to these questions. When you have completed this questionnaire, please return it unsigned to the mailbox of Blaine Worthen.

Thank you.

1. a. Have you personally used the services or facilities of the Laboratory of Educational Research (LER)?

Yes ___	Boulder	9	Denver	3	Total	12
No ___	Boulder	11	Denver	4	Total	15

b. If "Yes," how often?

1 time; 2, 3, 5, 6, 10 times; very often, once every two weeks.

c. If "yes," for what purpose or in what manner?

"Data processing; statistical advising; computer usage; consultation on research."

2. a. How many of your advisees used the services or facilities of LER?

Boulder		Denver		Total	
Number	Faculty	Number	Faculty	Number	Faculty
0	2	0	5	0	5
1	4	3	1	1	4
2	6	5	1	2	6
3	2			3	3
4	1			4	1
6	3			5	1
12	1			6	3
"Several"	1			12	1
				"Several"	1

b. If one or more of your advisees did use LER services, in what manner or for what purpose were they used?

"Design of research; computer usage; statistical consultation; evaluation design consultation."

3. a. Did you attend any special presentations or meetings arranged and conducted by LER during the 1968-1969 academic year?

Yes __	Boulder 3	Denver 1	Total 4
No __	Boulder 17	Denver 5	Total 22

b. If "Yes," approximately how many?

1; or no response

4. Do you feel that the activities and objectives of LER are helping to meet the research needs of the School of Education as identified in the report of the Ad Hoc Committee on Research, Measurement, and Statistics and the School of Education Self-Study?

Yes __	Boulder 17	Denver 6	Total 23
No __	Boulder 1	Denver 1	Total 2

The LER trainees for the period indicated were as follows:

- Glenn Bracht
- Daniel Bauman
- Nancy Burton
- James Collins
- Scott Harrington
- Ralph Hakstian
- Stephen Jurs
- Robert Mendro
- Jon Morris
- Masahito Okada
- James Sanders
- Arthur White

Please indicate Strong Agreement (SA), Agreement (A), Indecision (?), Disagreement (D), or Strong Disagreement (SD) to each of the following statements as they apply to the above LER trainees. (If you know none of these students, omit Nos. 5-8.)

5. They seem not to have an adequate interest in education.

	SA	A	?	D	SD	
	2	1	1	7	6	Boulder
	1	0	0	0	2	Denver
	3	1	1	7	8	Total

6. The do not seem to be willing to give assistance to other graduate students on research and evaluation problems

	SA	A	?	D	SD	
	0	0	3	6	8	Boulder
	0	0	0	0	2	Denver
	0	0	3	6	10	Total

7. They are primarily interested in statistics (as opposed to testing, educ. psych., counseling, math. educ., etc.)

	SA	A	?	D	SD	
	2	3	7	4	1	Boulder
	0	0	0	1	1	Denver
	2	3	7	5	2	Total

8. They seem to have the qualities needed to be effective as

	SA	A	?	D	SD	
a. university professors	3	9	5	0	0	Boulder
	2	0	0	0	0	Denver
	5	9	5	0	0	Total
b. public school research workers	3	8	3	0	0	Boulder
	2	0	0	0	0	Denver
	5	8	3	0	0	Total

Please mark either SA, A, ?, D, or SD for each of the following statements as they pertain to the operations of LER.

9. LER should tutor Education graduate students having difficulty in statistics courses

	SA	A	?	D	SD	
	1	7	4	7	1	Boulder
	2	2	0	2	0	Denver
	3	9	4	9	1	Total

10. LER has been successful in improving the quality of research performed in the School of Education

a. by graduate students	6	11	2	1	0	Boulder
	3	1	3	0	0	Denver
	9	12	5	1	0	Total
b. by faculty	3	4	7	2	0	Boulder
	1	2	1	0	1	Denver
	4	6	8	2	1	Total

11. LER is not being of service to the public schools of Colorado

SA	A	?	D	SD	
0	1	13	4	0	Boulder
0	0	4	0	2	Denver
0	1	17	4	2	Total

12. In training graduate students, LER is placing too much emphasis on research and not enough on learning about other areas of education

SA	A	?	D	SD	
1	4	9	3	2	Boulder
0	0	5	2	1	Denver
1	4	12	5	3	Total

13. If I had a question pertaining to research design, measurement, statistics, or computer use, I would be reluctant to consult LER for assistance

SA	A	?	D	SD	
0	0	2	8	11	Boulder
0	0	1	1	5	Denver
0	0	3	9	16	Total

14. Please suggest ways in which LER could be of greater service to the research efforts of the entire School of Education (including faculty, graduate students, etc.):

Boulder: "A brochure should be distributed explaining the services of LER."

"Every report from my students about LER has been favorable. Keep up the good work."

"Limit outside state work and paid consultancies and earn salaries here first."

"I had the feeling that LER was primarily concerned about the education of research specialists and not about assisting others in doing research."

"The staff and fellows are doing superior work."

"LER has done much to raise the stature of the School of Education."

"The faculty is outstanding, perhaps the finest of its kind in the nation."

"I consider it to be indispensible, the best addition to the School since I have been here."

"I consider the LER a fine asset to the School of Education and pledge my support of its activities."

"What is the LER?"

"If the faculty were doing more research, you could be more helpful. As it is, I am not sure what can be done."

Denver: "I don't think there's a better one in the country."

"An orientation on LER and its capabilities for faculty and graduate students in Education at Denver and Colorado Springs would be helpful."

The data above indicate that while the LER is utilized by only approximately 35 per cent of the faculty themselves, over 50 per cent have advisees who have used LER services. In addition, approximately

85 per cent of the respondents feel that the LER is helping to meet important research needs of the School of Education. LER Fellows are viewed as willing to help, interested in the field of education, and possessing qualities necessary to be effective university professors or public school research workers. It seems that a number of respondents are not completely aware of the role and services of the LER and an effort should be made to communicate these more effectively to the School of Education faculty. This is particularly true of respondents from the Denver Center, where distance is an impeding factor both in interfereing with communication and limiting access to the LER facilities. This problem should be ameliorated at least in part by the addition of a new faculty member, Blaine R. Worthen, to serve in a dual role as coordinator of research at the Denver Center and Co-Director of the LER.

The most active and significant aspect of LER's service to the University is the assistance it extends to graduate students performing research for advanced degrees. A total of 1,492 man-hours of free consulting was provided to graduate students through LER. A total of 760 of these hours, slightly over half, were spent with the graduate students of the School of Education. There were 473 man-hours of service provided to faculty members of the University (outside of LER). In addition, LER Fellows spent 445 man-hours working with LER directors on research projects in which they were engaged. (All figures are for trainees only and do not include contributions of the LER directors.)

As shown below, the mean number of internship hours was 495 for the total group with a range from 270 to 892 hours.

Student	Hours
1	892
2*	594
3**	356
4	477
5	406
6*	—[a]
7	396
8	487
9*	520
10	270
11	568
12	478

[a] Total hours not available for this Fellow

*NDEA Fellows

**Research Assistant, University of Colorado

Approximately 5,445 man-hours of practical experiences were logged by the LER Fellows in research activities. These activities were categorized into seven divisions as follows:

Activity	Percent
Problem Development	17
Research Design	11
Statistical Analysis	26
Measurement and Instrument Development	10
Experimentation	4
Writing; proposals, reports, etc.	8
Computer Utilization	24
	100

The internship activity breakdown followed a rather similar division for all Fellows.

At the request of the LER Directors, three persons under whose supervision internships were served during 1968-69, recorded their impressions and evaluations of the experience. Their letters are reproduced on the following pages.

escp EARTH SCIENCE CURRICULUM PROJECT
P.O. BOX 1559 BOULDER, COLORADO 80302 TELEPHONE (303) 447-8150

October 15, 1969

Dr. Kenneth D. Hopkins, Director
Laboratory of Educational Research
McKenna Hall, University of Colorado
Boulder, Colorado 80302

Dear Dr. Hopkins:

With this letter, we are expressing our complete satisfaction with the cooperation we have and are receiving from the staff and interns in the Laboratory of Educational Research (LER) at the University of Colorado.

The interns who have worked with us on the research problems have been most competent. Although they were not always familiar with the subject of earth science, they were able to offer meaningful suggestions to us. They were very practical in their outlook and quite honest in their recommendations. When we presented a problem with which they were not familiar, they searched out the necessary literature and met with us at a later date with appropriate information. Although we have received the services of several of your interns, we would like to commend especially Mr. Daniel Bauman and Mr. James Sanders for their counsel during the past year. Both have exemplified a professional research and evaluation competence that reflects highly the program of the Laboratory of Educational Research. We would be pleased to have either or both as professional staff members of our Project.

The specific services rendered by the LER included an analysis of data gathering in preparation for a research study, use of a Stake Model for establishing a data matrix, assistance in the establishment of several evaluation instruments for use in a national in-service institute study we are conducting for the National Science Foundation, numerous computer programs for data processing, Campbell & Stanley research designs for several studies conducted and being conducted by our Project, and LER staff and intern analysis of our instruments and designs. The interns have also recommended several books and studies from the literature which have been helpful in our planning.

The quality of the work from the persons in the LER has been of such high quality that we are building into our future proposals specific provisions for cooperation with the LER. Both the inner-city Environmental Studies Program proposal and the pre-service Teacher Preparation proposal currently under review by the National Science Foundation have provisions for research associates who would work with the interns in the LER to continue our research efforts. Our research associates would have expertise in earth science education and an interest in research. They would work with the LER interns in conducting our research program. Our Teacher Preparation proposal also includes provision for cooperation with ERIC in our providing a clearinghouse of research in earth science education, from both the standpoints of reviewing research and the stimulation of research. We hope to have the assistance of the interns from the LER to help us with this, as it is appropriate to the program of the LER.

The interest and action in the area of research and evaluation of our project during the last year and a half is the direct result of contact and interaction with the professional staff of the LER and the interns. Prior to that we viewed with suspicion most educational research. The practical, honest, and meaningful interactions with the LER personnel have changed our views and given us a new insight into research in which we should be involved.

There is one thing that might help us as a potential user of the services of the Laboratory of Educational Research. This would be some sort of publication that would indicate those areas of services in which the LER is interested. For example, we are in need of a great deal of assistance in the area of evaluation and research in the Affective Domain. Is the LER interested in providing such assistance? If so, to what extent? Do any of your interns have an area of interest to them personally that we might capitalize upon in relation to our needs? Information such as this would be helpful to us.

Our project feels very fortunate to be geographically close to your LER. We hope that our research needs have provided some meaningful experiences for your interns and that our cooperation may be expanded in the months and years ahead.

Sincerely yours,

William D. Romey
Director

WDR/pd

#s 43

UNIVERSITY OF COLORADO
BOULDER, COLORADO 80302

SCHOOL OF EDUCATION

October 24, 1969

Dr. Kenneth Hopkins, Director
Laboratory of Educational Research
School of Education

Dear Ken:

During the past year I conducted an interim evaluation of the Cherry Creek Teacher Education Project in which we attempted to secure reactions of teachers, student teachers and university teacher education personnel to a cooperative teacher education venture involving the Cherry Creek Schools and the University of Colorado. In conducting this work, I had assistance from the Laboratory of Educational Research fellows and especially a great deal of help from Dan Bauman. He helped in the production of our instruments and in the compilation of the data. His assistance in the use of the computer was invaluable.

I also wish to express my appreciation for the help the laboratory has given our graduate students in improving their research designs and in the processing of data. We, as a School of Education, are indeed indebted to you for the services which you have rendered.

Cordially yours,

Harold M. Anderson
Professor of Education

:sf

UNIVERSITY OF COLORADO
BOULDER, COLORADO 80302

October 24, 1969

Director
Laboratory of Educational Research
School of Education
University of Colorado
Boulder, Colorado 80302

Dear Dr. Hopkins:

This letter is to commend the faculty, staff and students of the laboratory for their cooperation in working with me on a study on which I am project director. The study deals with an evaluation of a "Model for Planned Changes in Elementary and Secondary Education" which is being conducted by the Cherry Creek School District and funded by the Charles F. Kettering Foundation.

The graduate students from the laboratory have had excellent training in that their services to this project have been extremely helpful. The faculty has provided time and advice which is deeply appreciated. The most important aspect of this working relationship is that the evaluation, in itself, will be a more valid and relevant report because of the help of LER fellows and staff. This in turn should help the school district in making more meaningful decision in future educational programs.

Sincerely,

Michael Kalk

Michael Kalk
Associate Professor in
Educational Psychology.

MK/ad

~~47~~ 45

It should also be noted that trainee responses to an item in Questionnaire B reveal that LER Fellows perceive LER clients as: (a) in need of the help they request, (b) receiving benefit from that help, and (c) grateful for such assistance.

10. Concept: LER Clients (Students and Faculty Served by LER)

	1	2	3	4	5	6	7	
Well Prepared	0	0	4	0	5	3	0	Poorly Prepared
They Benefit	3	7	2	0	0	0	0	They Don't Benefit
Ungrateful	0	0	0	1	1	6	4	Grateful

B. Internship Experiences

Several items in Questionnaires A and B were used to obtain from the Fellows their opinions concerning the value of the internship program and to identify the ingredients of a good internship experience. The tabulated results appear below.

	Strongly Agree 1	2	3	4	Strongly Disagree 5
16. The internship experiences outside of the university were very valuable	1	4	2	5	0
17. Too much internship time is required for meeting the relevant objectives	1	3	3	4	1
19. I resented having to assist graduate students with their course work	0	0	1	5	6

11. Concept: Internship Supervision

	1	2	3	4	5	6	7	
Too Closely Supervised	0	0	0	5	3	4	0	Not Enough Supervision
Assignments Clear	1	5	3	0	2	0	1	Assignments Unclear
Insufficient Time Given for Tasks	0	1	1	2	3	2	3	Enough Time Given for Tasks

12. Concept: Internship

Valuable	5	2	2	1	2	0	0	Worthless
Too Much	1	2	2	6	0	1	0	Too Little
Conducive to Individual Research	2	1	2	0	5	1	1	Not Conducive to Individual Research
Essential	5	3	1	0	2	1	0	Not Essential

13. The list below contains some of the kinds of activities and tasks that LER Fellows might perform as part of their internship duties. Please respon to each item in the list in the two ways listed below:

FIRST
Check frequency of occurrence for each activity

SECOND
Check appropriate value you attach to each task, whether or not you were called upon to perform it.

Often	Sometimes	Seldom	Never		Had Great Value	Had Some Value	Had Littl or n Valu
2	3	5	2	Led Student LER Discussion (Brown Sack, Special Seminar)	4	7	0
0	0	2	10	Helped with research budgets	0	7	4
0	1	2	9	Assisted in administrative duties	0	4	6
0	0	0	12	Took minutes in meetings	0	0	10
0	1	3	8	Planned and arranged seminars or?	1	5	4
1	4	6	1	Attended professional meetings	9	2	0
0	0	1	11	Assisted with supervisor's professional correspondence	0	3	7
0	5	2	5	Helped draft or edit supervisor's publications	3	9	0
0	1	2	9	Filled out questionnaires for supervisor received from outside of Lab.	0	4	6
3	7	0	2	Designed a research study	10	1	0
0	5	5	2	Reviewed and/or abstracted literature on a topic	5	6	0
2	6	4	0	Conceptualized a research problem	10	2	0
0	5	6	1	Assisted in other conceptual activities	6	6	0
0	0	4	8	Wrote a research proposal	4	4	2
4	7	1	0	Designed statistical analysis	10	2	0
2	5	5	0	Wrote computer programs	3	9	0
0	3	6	3	Conducted Experiments	9	2	0
3	5	4	0	Constructed research instruments	8	4	0
1	3	5	3	Administered or scored research instruments	1	8	3
0	4	4	4	Collected data in other ways	2	7	1
0	5	2	5	Assisted in actual teaching of courses	9	1	0
1	4	2	5	Read or graded papers	2	9	1
0	1	5	6	Administered or scored classroom exams	0	5	7
0	0	1	11	Assisted in preparing lectures or speeches for supervisor	1	8	1
0	2	4	6	Did typing, filing, and/or answering telephones	0	0	12
0	0	6	6	Did collating, duplicating, tallying, and/or bookkeeping	0	1	11
1	8	3	0	Used calculator for data analysis	1	9	2
0	5	5	2	Made tables, graphs, or charts	1	6	5
2	5	4	1	Coded and/or tabulated data	0	5	7
2	8	1	1	Keypunched and/or verified data	0	6	6
5	7	0	0	Submitted data for computer analysis	3	8	1
3	7	2	0	Used other computer-related equipment	3	8	1
7	4	1	0	Interpreted data	10	2	0
1	5	5	1	Helped write up final research report	8	3	0
0	5	3	4	Wrote research article	9	1	0
0	3	2	7	Gave a research paper	9	1	0
0	0	2	10	Set up physical facilities for conferences or lectures	0	2	8
0	1	0	11	Assisted supervisor with personal matters	0	2	8
0	1	7	4	Engaged in manual labor (moving furniture, etc.)	0	1	10
2	4	4	2	Gathered data for thesis or dissertation	8	3	0
Often	Sometimes	Seldom	Never		Had Great Value	Had Some Value	Had Littl or n Valu

47

In general, the Fellows expressed the opinion that the internship experiences are essential and valuable. Unlike previous years, there was no strong opinion that the internship required too much time. A desire for more supervision while allowing for involvement in more individual research was expressed. Constructive steps have been taken to facilitate this desire.

There is a continued feeling that the internship experiences outside of the university are of a questionable value. It may prove necessary in the future to be more selective in the kinds of projects and agencies with which internships are arranged to insure their value to the trainees.

The Fellows indicated the following internship activies were of greatest value:

a. research related activities, including
    1. conceptualization of a research problem
    2. design of research studies
    3. design and interpretation of statistical analysis, including computer utilization
    4. writing and reporting of completed research
    5. attendance at professional meetings
b. assisting in instruction of courses, including
    1. actual teaching
    2. reading and grading of papers

The frequency of occurrence for each of the above activities indicated that in general, these activities are much more prevalent than others.

Conversely, the trainees indicated that their internship had provided them with little opportunity to engage in three activities they viewed as very valuable: (a) writing research proposals, (b) giving research papers, and (c) conducting experiments. LER directors were alerted to (b) above through informal feedback and steps have already been taken to provide this type of experience. Ways of providing more internship opportunities in relation to (a) and (c) above should be studied.

Two activities viewed as having little or no value by a majority of LER Fellows occurred with some frequency. They were: (a) coding and/or tabulating data and (b) keypunching and/or verifying data. While these are essential components of the research process, these data may indicate a lack of sufficient clerical support for the volume of data processing which is handled by LER Fellows as part of their internship experience. Perhaps ways should be found for those receiving LER services to provide clerical help for these activities.

VIII. LER Activities

To evaluate further the training program, the 1968-69 Fellows were asked to respond to items on Questionnaires A and B that elicited opinions about the program in general, interaction among the Fellows, effectiveness of intra-LER communications and training sessions, LER facilities, equipment, financial support, and professional memberships and reading preferences. Tabulated responses to these items and other explanatory data are included in the sections that follow. In most cases, the data are self-explanatory and no interpretation is offered.

A. General Reactions

	Strongly Agree 1	2	3	4	Strongly Disagree 5
5. I did not learn much new during this period.	0	0	0	1	11
6. The program made possible a degree of research competence that would not have been otherwise possible for me.	9	2	0	0	1
7. The program had little effect on other graduate students in the School of Education	0	0	1	7	4

		Strongly Agree				Strongly Disagree
		1	2	3	4	5
11.	My time was well spent.	4	7	1	0	0
12.	The program met my expectations.	8	4	0	0	0
13.	Too much time was devoted to trivial matters.	0	1	2	6	3
14.	The program should have been more flexible to meet individual needs.	0	1	3	4	4

B. Interaction among Fellows

		Strongly Agree				Strongly Disagree
		1	2	3	4	5
8.	We worked well together as a group.	9	1	2	0	0
9.	The informal group interaction was valuable.	9	3	0	0	0
10.	There was little time for informal conversation.	0	0	1	4	7

One plausible explanation for the apparently positive interaction is that Fellows valued one another to a high degree. This interpretation is supported by data from the following item.

1. Concept: LER Fellows

	1	2	3	4	5	6	7	
Bright	9	2	1	0	0	0	0	Dull
Poorly Motivated	0	0	0	0	0	7	5	Highly Motivated
Flexible	0	6	2	2	0	1	1	Inflexible
Ambitious	6	4	2	0	0	0	0	Lazy
Young	2	5	3	1	1	0	0	Old

C. Effectiveness of Intra-lab Communications and Training Sessions

During the past year three prominent persons from the field of education visited the University of Colorado and provided seminar experiences for the LER Fellows. These three were Dr. John B. Biggs of the Educational Research Unit of Monash University, Clayton Victoria, Australia, Dr. Raymond B. Cattell of the University of Illinois, and

Dr. Julian Stanley of Johns Hopkins University. The latter two were personally invited by the LER directors and interacted formally and informally with the Fellows. The Fellows indicated on a questionnaire item that they found these seminar speakers interesting and the experience beneficial. However, they also felt that these seminars did not occur often enough.

9. Concept: Seminar Speakers (From other school, campuses, etc.)

	1	2	3	4	5	6	7	
Too Often	0	0	0	2	7	1	2	Not Often Enough
Interesting	3	1	5	3	0	0	0	Uninteresting
Beneficial	3	2	7	0	0	0	0	Not Beneficial

The LER also schedules meetings and seminar situations at which the LER directors and Fellows present informal discussions on various topics. In the past year three Fellows presented the papers which they were later to present at the AERA Convention. Also, Dr. Glass and Ralph Hakstian (a Fellow) presented a series of scheduled lectures on multivariate analysis. At times the directors and Fellows present for discussion at the scheduled weekly seminars discuss any topics on which they are presently working, including dissertation work. In the last year, the Fellows spent a total of approximately 450 hours in seminars and similar meetings.

An additional effort has been made to inform Fellows of new concepts, developments, and techniques in research and research-related areas by routing relevant materials to all Fellows in the LER. The Fellows also route materials they believe to be of interest to other LER personnel. In general, this thechnique is well received; however, one comment about lack of selectivity in what was routed stimulated the following item.

	Strongly Agree 1	2	3	4	Strongly Disagree 5
18. I was asked to read too many irrelevant books and papers which are circulated through the Lab.	0	0	1	9	2

Evidently, the routing system is viewed by the trainees as desirable.

D. LER Facilities and Equipment

At present (October 1969) approximately 1150 square feet in the basement of McKenna building is used to house LER. Of this, three hundred and fifty square feet contains the offices of Drs. Hopkins, Glass, and Worthen. A large 750 square foot room is used by the secretary and the twelve interns, and 150 square feet contains the laboratory equipment in an adjoining room.

Each of the twelve Fellows has a desk, filing cabinet space, and available book shelf space. The secretary has a desk and several filing and storage cabinets. In addition, the laboratory's library materials and two tables available for conferences with clients are housed within this central room. The present arrangement is disruptive of study whenever consultation with a client takes place. The noise and space factors make it difficult to consult with more than one client at a time.

The LER owns six electrical calculators and two typewriters, one for secretarial use and one for the interns. A keypunch machine and a 3M Copier are rented by the LER. This year, the LER has been allotted $1,800 by the School of Education for computer time.

Several items, contained in Questionnaire B, elicited trainee responses relating to adequacy of facilities, equipment, and library materials. Tabulations of the responses appear below.

2. Concept: Physical Facilities a) for personal academic work

	1	2	3	4	5	6	7	
Inadequate	0	4	1	1	1	3	2	Adequate
Convenient	4	2	2	2	1	1	0	Inconvenient
Above Average	1	4	1	0	2	4	0	Below Average

b) for consulting assignments

Inadequate	1	4	0	3	3	1	0	Adequate
Convenient	3	3	1	1	2	2	0	Inconvenient
Above Average	0	2	1	4	2	2	1	Below Average

3. Concept: Equipment for Data Analysis

Inadequate	0	0	0	0	3	4	5	Adequate
Convenient	4	1	3	0	1	3	0	Inconvenient
Above Average	5	2	2	1	1	0	0	Below Average

4. Concept: Library of Reference Materials

Inadequate	0	0	0	1	3	5	3	Adequate
Convenient	6	5	1	0	0	0	0	Inconvenient
Above Average	5	4	2	1	0	0	0	Below Average

It is clear that present facilities will not allow an expansion of LER to more than its present level of twelve Fellows. Tentative plans for a School of Education Building allot approximately 3,000 square feet to house LER. In the interim period, the LER is tenatively scheduled to be moved to occupy some 3,832 square feet in the Business School Annex. Such space appears now to be a necessity if LER is to grow at the present projected rate. Any developments which jeopardize the plans for construction of a School of Education Building will place in jeopardy the continued growth and expansion of LER.

E. Financial Support for Trainees

The level of basic financial support is that specified under the Title IV training program, as follows:

First year Fellow (no master's degree)	$[illegible] per year
First year Fellow (master's degree)	$2600 per year
Second year Fellow	$2800 per year

In addition, Fellows receive $500 annually for each dependent.

Fellows' perceptions of the adequacy of this level of financial support was yielded by an item from Questionnaire B.

6. Concept: Fellowship Stipends

	1	2	3	4	5	6	7	
Too Little	0	2	3	7	0	0	0	Too Much
Fair	4	1	4	2	1	0	0	Unfair

Funds from LER paid consulting activities are also used to help support Fellows' professional activities by paying for: (a) travel to important professional conventions (generally AERA), and (b) memberships in AERA (including AERA journals) and NCME (including the *Journal of Educational Measurement*). Fellows perceptions of the adequacy of such funds are tabulated below.

7. Concept: Financial Support (Professional activities, e.g., travel to conventions)

	1	2	3	4	5	6	7	
Too Little	1	3	5	3	0	0	0	Too Much
Fair	3	2	2	3	2	0	0	Unfair

F. Professional Activities of Fellows

Some data on professional activities of LER Fellows were collected through use of two items in Questionnaire B. Specifically, trainees were asked to indicate new memberships in professional associations and preferences in reading professional periodicals. The tabulated responses to these items appear below.

12. List any professional education or social science associations of which you became a member during the '68-'69 academic year:

American Educational Research Association (named 6 times)
National Council on Measurement in Education (named 7 times)
Phi Delta Kappa (named twice)
National Association of Research in Science Teaching (named twice)
American Psychological Association (named once)
American Personnel and Guidance Association (named once)
Association of Counselor Educators and Supervisors (named once)
Association of Measurement and Evaluation in Guidance (named once)

13. Check the professional journals and periodicals which you read regularly:

Frequency	
10	American Educational Research Journal
	Biometrics
	Biometrika
9	Educational and Psychological Measurement
1	Harvard Educational Review
	Journal of Applied Psychology
	Journal of Education
8	Journal of Educational Measurement
3	Journal of Educational Psychology
4	Journal of Educational Research
	Journal of Experimental Education
4	Phi Delta Kappan
	Psychological Bulletin
	Psychological Review
1	Psychometrika
11	Review of Educational Research
	Teachers College Record
	Others
1	Educational Researcher
1	Forum (KOΠ)
1	Journal of Research in Science Teaching
1	ACM
1	Personnel and Guidance Association Journal
1	Counselor Educator and Supervisor Journal
1	Association for Measurement and Evaluation in Guidance

IX. Research

LER Fellows and staff pursue an active program of funded and independent research. The research of LER Fellows was listed earlier in this report. The following list includes the publications and projects of LER directors for 1968-69.

Kenneth D. Hopkins

"The Constancy of Verbal and Non-Verbal IQ: Grade One through Eleven" (with Glenn H. Bracht). Paper presented to the American Educational Research Association, Los Angeles, February 5-8, 1969, 10 pp. (Abstract: Crackenberg, Vincent (ed.), AERA Paper Abstract, AERA, pp. 252-255, 1969).

"Five-Year Stability of Language and Non-Language IQs," Research Paper No. 23, Laboratory of Educational Research, University of Colorado, January 1969 (with M. Bibelheimer).

"The Experimental Unit in Statistical Analysis," *Research Paper No. 28*, Laboratory of Educational Research, University of Colorado, March 1969 (with P. D. Peckham and G. V Glass).

"Predicting Grade One Reading Performance: Intelligence vs. Reading Readiness Tests," *Journal of Experimental Education*, *37*, 31-33, Spring 1969 (with E. G. Sitkei).

"Product Evaluation of New Design for Learning: A Junior High School Model, Year I," Laboratory of Educational Research, University of Colorado, mimeo, 51 pp. (with G. H. Bracht).

"Miller's *Statistical Concepts and Applications*, *A Non-mathematical Explanation*," review in *Educational and Psychological Measurement*, *29*, 221-223, 1969 (with G. H. Bracht).

"Regression and the Matching Fallacy in Quasi-Experimental Research," *Journal of Special Education* (in press).

"The Experimental Unit in Statistical Analysis," *Journal of Special Education* (with P. D. Peckham and G. V Glass) (in press).

"Multiple Comparisons in Research: A Response," *American Educational Research Journal* (with R. A. Chadbourn) (in press).

Gene V. Glass

"Reflections on Bloom's 'Toward a Theory of Testing which Includes Measurement-Evaluation-Assessment,'" Paper read at the Symposium on Problems in the Evaluation of Instruction, December 13-15, 1967, Los Angeles, Calif., UCLA. (Also appears as *Research Paper No. 8*, Laboratory of Educational Research, University of Colorado, December 1967, and as Occasional Paper No. 11, UCLA, Center for the Study of Evaluation, September,1968.)

"Report of the American Educational Research Association 1968 Research Training Presessions Program," July 1968, 365 pp.

Author's Guide and Style Manual for the Review of Educational Research. Washington, D.C.: American Educational Research Association, August 1968, 37 pp.

"Measures of Association in Comparative Experiments: Their Development and Interpretation," *Research Paper No. 14*, Laboratory of Educational Research, University of Colorado, September 1968 (also presented at the annual meeting of AERA; Los Angeles, Calif., 7 February 1969) (with A. R. Hakstian).

"Two Generations of Evaluation Models." Paper presented at the Nebraska Personnel and Guidance Association Meetings, Lincoln, Neb., September 29, 1968.

"Educational Piltdown Men," *Phi Delta Kappa*, *50*, 148-151, November 1968.

"The External Validity of Experiments," American Educational Research Journal, 5, 437-474, November 1968 (with G. H. Bracht).

"Establishing a Graduate Research Training Program and the Laboratory of Educational Research." Final Report USOE Project No. 6-1860, Laboratory of Educational Research, University of Colorado, November 1968 (with K. D. Hopkins).

"Correlations with Products of Variables: Derivations and Implications for Methodology," American Educational Research Journal, November 1968.

"The Doman-Delacato Rationale: A Critical Analysis," Educational Therapy, Winter 1968 (with M. P. Robbins).

"Analysis of Data on the Connecticut Speeding Crackdown as a Time-Series Quasi-Experiment," Law and Society Review, Winter 1968.

"Review of Chassan's Research Design in Clinical Psychology and Psychiatry," Educational and Psychological Measurement, 28, 621-623, 1968 (with A. R. Hakstian).

"Response to Traub's 'Note on the Reliability of Residual Change Scores,'" Journal of Educational Measurement, 5, 265-267, 1968.

"A Simple Proof that the Sum of the Squared Errors in Estimating $\underline{Y}$ from $\underline{X}$ via b_1 and b_0 is Minimal," American Statistician, 25-26, January 1969 (with J. C. Stanley).

"The Factorial Structure of Reasoning, Moral Judgment, and Moral Conduct." Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, Calif., 6 February 1969 (with W. Beth Stephens, J. A. McLaughlin, and C. K. Miller).

"The Effects of the Position of an Organizer on Learning Meaningful Verbal Material," Research Paper No. 24, Laboratory of Educational Research, University of Colorado, January 1969. (Presented at the annual meeting of AERA, Los Angeles, Calif., 6 February 1969.) (with D. L. Bauman and S. A. Harrington)

"The Approximate Sampling Distribution of the Stratified Alpha Generalizability Coefficient," Research Paper No. 26, Laboratory of Educational Research, University of Colorado, January 1969. (Presented at the annual meeting of AERA, Los Angeles, Calif., 7 February 1969.) (with R. L. Mendro)

"The Growth of Evaluation Methodology," Research Paper No. 27, Laboratory of Educational Research, University of Colorado, March 1969 (Third Version, September 1969, 58 pp).

"The Experimental Unit in Statistical Analysis," Research Paper No. 28, Laboratory of Educational Research, University of Colorado, March 1969 (with P. D. Peckham and K. D. Hopkins)

"Plan for the Future of the Review of Educational Research." Paper prepared for the Association Council of the American Educational Research Association, April 1969. 12 pp.

"The British Crackdown on Drinking and Driving: A Successful Legal Reform," Research Paper No. 29, Laboratory of Educational Research, University of Colorado, May 1969, 30 pp. (in press in American Behavioral Scientist)(with H. L. Ross and D. T. Campbell)

Mastery Test Items for Courses in Educational Research Methods, Boulder, Colorado: Laboratory of Educational Research, University of Colorado, May 1969, 42 pp. (with J. R. Sanders and S. G. Jurs).

"Note on Jensen and Rohwer's 'Mental Retardation, Mental Age, and Learning Rate,'" Journal of Educational Psychology, 1969.

"Review of Baggaley's Mathematics for Introductory Statistics, A Programmed Review," Educational and Psychological Measurement, Fall 1969 (with J. R. Collins).

"Delacato--Neurologische Organisatie en Leesonderwijs: Een Kritiek," Pedagogish Forum (in press) (with M. P. Robbins and J. Tuinman).

"An Analysis of Delacato's Experimental Evidence," Pediatrics (in press) (with M. Okada).

"Geometric Proof of the Restriction on the Possible Values of r_{xy} when r_{xz} and r_{yz} are Fixed," Educational and Psychological Measurement (in press) (with J. R. Collins).

X. Professional Staff

1968-69

Dr. Kenneth D. Hopkins served as Director of the LER during 1968-69, while Dr. Gene V. Glass served as Co-Director. The LER Fellows gave their opinions to these directors on one item in Questionnaire B.

5. Concept: LER Directors

	1	2	3	4	5	6	7	
Approachable	8	4	0	0	0	0	0	Not Approachable
Not Helpful	0	0	0	0	0	3	8	Helpful
Scholarly	10	2	0	0	0	0	0	Not Scholarly
Competent Administrators	3	7	1	1	0	0	0	Incompetent Administrators
Respected Personally	10	2	0	0	0	0	0	Not Respected Personally

1969-70

It is anticipated that persons with interest in educational research methodology who join the School of Education faculty will joint actively in LER and assume a share of the growing responsibilities. In August of 1969, Dr. Blaine R. Worthen joined the faculty as assistant professor of educational psychology, with particular responsibilities for the research and statistics program at the Denver Center. During 1969-70, Kenneth D. Hopkins will continue to serve as Director of the LER, Blaine Worthen will serve as Co-Director, and Gene V. Glass will serve as a staff member with special responsibilities for developing an evaluation unit for the LER.

Resumes for Hopkins, Glass, and Worthen appear in Appendix B along with resumes for all persons who instruct in the core curriculum. As a new faculty member not previously associated with the LER, a more complete vita for Dr. Worthen is included in this section.

Vita - Blaine R. Worthen

Present Position:

Assistant Professor of Educational Psychology, School of Education, University of Colorado

Educational Data:

B.S. - University of Utah - 1960
M.S. - University of Utah - 1965

Thesis: "Discovery vs. Expository Classroom Instruction: An Investigation of Teaching Mathematics in the Elementary School." Unpublished master's thesis, University of Utah, 1965.

Ph.D. - The Ohio State University - 1968

Dissertation: "The Impact of Research Assistantship Experience on the Subsequent Career Development of Educational Researchers." Unpublished doctoral dissertation, The Ohio State University, 1968.

Honors Received:

1. University of Utah Normal Scholarship, 1959-60.

. Received B.S. with "High Honors"--elected to Phi Kappa Phi Honor Society, 1960.

3. Granted a "Doctoral Internship in Education" (national fellowship competition) at The Ohio State University, 1965-67.

Honors Received (cont.):

4. Chosen as "Staff Associate" (national fellowship competition), University of Chicago, 1965. Declined, in order to accept offer at The Ohio State University.

5. Selected as the 1968 Ohio State University Flesher Fellow (Annual award to outstanding male graduate student in education at The Ohio State University), 1968.

Professional Positions:

1. Elementary school teacher, 1960-62.

2. Instructor, University of Utah Campus School, 1962-64.

3. Lecturer in education, College of Southern Utah, summer, 1964.

4. Instructor, College of Education, University of Utah, 1964-65 (half time).

5. Research Assistant, Department of Educational Psychology, University of Utah, 1964-65 (half time).

6. Doctoral Intern in Education, School of Education, The Ohio State University, 1965-67.

7. Research Associate, College of Education, The Ohio State University, 1967-68.

8. Associate Director, Evaluation Center, The Ohio State University, 1967-69.

9. Assistant Professor, College of Education, The Ohio State University, 1968-69.

10. Assistant Professor, School of Education, University of Colorado, 1969-present.

Contracts and Grants Received and Projects Directed:

Completed:

Director, National Evaluation Leadership Project, 1967-68. (Funding received with D. L. Stufflebeam) ESEA Title III, $48,000 (12 months).

Director, Strategies for Educational Change: A Dissemination Project, 1967-68. The Ohio State University Development Fund, $8,000 (12 months).

Director, O.S.U.--Xenia Evaluation Project, 1968-69. (Funding received with D. L. Stufflebeam) ESEA Title III, $27,110 (12 months).

Contracts and Grants Received and Projects Directed (cont.):

Currently Underway:

Director, National Study of Research Apprenticeship Experiences, 1968-69. Phi Delta Kappa International, $8,390 (18 months).

Director, AERA Study of Requirements and Procedures for Training Researchers and Research-Related Personnel, 1969-70. USOE Research Training Branch, $67,673 (18 months).

Academic Teaching Experience:

Workshop in Teaching Mathematics (College of Southern Utah-Summer, 1964).

Elementary Mathematics Sections: Elementary Education Practicum (University of Utah-Summer, 1964).

Workshop: Methods, Materials and Processes in Arithmetic (University of Utah-Autumn, 1964-Winter, 1965).

Evaluation Functions and Methodology in Education (The Ohio State University-Spring, 1968, teamed with D. Stufflebeam).

Seminar in Educational Research (The Ohio State University-Winter, 1969).

Research Processes: Practicum in Educational Research (The Ohio State University-Winter, 1969, teamed with R. Bargar).

Experimental Design in Education (The Ohio State University-Winter, 1969, teamed with R. Hammond.)

Elementary Statistical Methods (University of Colorado-Fall, 1969).

Evaluation Models and Procedures (University of Colorado-Fall, 1969).

Methods of Educational Research (University of Colorado-Spring, 1970).

Other Professional Experience:

1. Participant in National Science Foundation Summer Institute in Mathematics, University of Utah, June-August, 1963.
2. Conferee with University of Illinois Committee on School Mathematics (UICSM), January 13-18, 1964.
3. Discussant, Utah Council of Teachers of Mathematics, Modern Mathematics Conference for Pre-service Elementary Teachers, February 15, 1964.
4. Guest Instructor (with S. M. Jencks), in video-taping a series of instructional TV programs, including discussions and classroom demonstrations in modern mathematics instruction. University of Utah Audio-Visual Aid Department, 1964-65.

Other Professional Experience (cont.):

5. Editor, *Strategies for Educational Change (SEC) Newsletter*, The Ohio State University, 1966-68.

6. Participant in Training Program in the Use of Management Information Systems in Educational Research and Development Activities, The Ohio State University, December, 1966.

7. Guest Editor, *Theory Into Practice*, June, 1967.

8. Consultant, ESEA Title III directors, State of Indiana (on evaluation), November 14, 1967.

9. Consultant, Saginaw City School System, Saginaw, Michigan (on evaluation design and process for regional supplementary service center, Title III, ESEA), October, 1967-present.

10. Consultant, Kanawha County Schools, Charleston, West Virginia (on evaluation design and instrumentation for exemplary space-related science project, Title III, ESEA), December, 1967-May, 1968.

11. Consultant, Mid-Continent Regional Educational Laboratory (on evaluation and research design), February 19-21, 1968.

12. Organizer and Senior Institute Instructor, National Science Teachers Association Institute on Evaluation for Science Program, Washington, D.C., March 24-27, 1968.

13. Lecturer, Latin American Institute, The Ohio State University (on measurement techniques), April, 1968.

14. Consultant, Educational Planning Mission to Ecuador, Agency for International Development (on designing a study to assess institutional capacity to implement educational plans), May 13-15, 1968.

15. Selected as participant in Second Annual Symposium, National Society of Professors of Educational Research, University of Colorado (focus on development of instructional materials in R, D, and D). November 19-21, 1968.

16. Consultant, Appalachian Regional Laboratory (on conceptualizing an information system for process evaluation), December 13, 1968.

17. Consultant, Xenia City Schools, Xenia, Ohio (on developing a Title III, ESEA proposal), December, 1968-January, 1969.

18. Lecturer, Defense Management Center, Wright-Patterson AFB, Ohio (series of lectures on measurement and evaluation), January-April, 1969.

19. Organizer, Symposium: An Analysis and Synthesis of Recently Completed Empirical Studies Related to Training Educational Research, Development, and Dissemination Personnel, The American Educational Research Association Annual Meeting, February 7, 1969.

20. Selected as discussant in Ninth Annual Phi Delta Kappa Symposium on Educational Research, Salt Lake City, Utah, April 10-12, 1969.

Other Professional Experience (cont.):

21. Organizer and Instructor, Institute on Evaluation, Elk Grove Training and Development Center, Illinois, March 3-6, 1969.

22. Selected as participant in AERA postsession on experimental design, College Park, Maryland, March 28–April 1, 1969.

23. Consultant, Bartholomew Consolidated School District, Columbus, Indiana (on developing an evaluation design and monitoring system), June 19-20, 1969.

24. Lecturer, Illinois Program for the Gifted Summer Institute on Evaluation of Learning, July 28-30, 1969.

25. Lecturer, EPDA Institutes on Evaluation, Columbus, Ohio (lectures on measurement techniques and use of simulation in training evaluators), July 7-11, 1969 and August 11-15, 1969.

26. Program Chairman, AERA Special Interest Group: Professors of Educational Research, 1969-70.

27. Consultant, Colorado State Department of Education, Denver, Colorado (on the Colorado Assessment Program), 1969-70.

Membership in Professional Associations:

Local, State, and National Education Association, 1960-64.
Phi Delta Kappa, 1964-present
American Educational Research Association, 1965-present
Association for Supervision and Curriculum Development, 1966-69.
National Society of Professors of Educational Research, 1968-present.

Professional Writings:

Books and Monographs

Clark, D. L. & Worthen, B. R. (Eds.) Preparing Research Personnel for Education. Bloomington, Indiana: Phi Delta Kappa, 1967.

Worthen, B. R. & Blanke, V. E. (Eds.) Strategies for Educational Change. New London, Connecticut: Crofts Educational Services. (In press).

Chapters in Books and Monographs

Brownell, S. M. & Worthen, B. R. "New Roles for Public Schools in Training Educational Researchers," in Clark, D. L. & Worthen, B. R. (Eds.) Preparing Research Personnel for Education. Bloomington, Indiana: Phi Delta Kappa. 1967.

Worthen, B. R. "A Comparison of Discovery and Expository Sequencing in Elementary Mathematics Instruction," in Scandura, J. M. (Ed.) Research in Mathematics Education. National Council of Teachers of Mathematics. 1967.

Professional Writings (cont.):

Articles Published in Professional Periodicals

Worthen, B. R. "The Innovation Dilemma," *Strategies for Educational Change (SEC) Newsletter*. Volume I, Number 10. November, 1966.

Hopkins, J. E. & Worthen, B. R. "Change in Public Schools," *Strategies for Educational Change (SEC) Newsletter*. Volume I, Number 12. May, 1967.

Worthen, B. R. "The Evolution of Title III: A Study in Change," *Theory Into Practice*. Volume 5, Number 3. June, 1967.

> Aslo reprinted as: "A Change in Title III?" *Strategies for Educational Change (SEC) Newsletter*. Volume II, Number 2. November, 1967.

Worthen, B. R. "Discovery and Expository Task Presentation in Elementary Mathematics," *Journal of Educational Psychology. Monograph Supplement*, Volume 59, Number 1, Part 2. February, 1968.

Worthen, B. R. "A Study of Discovery and Expository Presentation: Implications for Teaching," *Journal of Teacher Education*. Volume 19, Number 2. Summer, 1968.

Worthen, B. R. "Toward a Taxonomy of Evaluation Designs," *Educational Technology*. Volume 8, Number 15. August 15, 1968.

Reports of Research Studies

Della-Piana, G. M., Eldredge, G., & Worthen, B. R. *Experiments in Discovery Learning: Part I, Sequence Characteristics of Text Materials and Transfer of Learning*. Salt Lake City: Bureau of Educational Research, University of Utah, 1965. (Part I of final report of USOE CRP Project 2277).

Worthen, B. R., Eldredge, G., and Della-Piana, G. M. *Tasks and Tests: Part II, Sequence Characteristics of Text Materials and Transfer of Learning*. Salt Lake City: Bureau of Educational Research, University of Utah, 1965. (Part 2 of final report of USOE CRP Project 2277).

Worthen, B. R. "A Re-analysis of Normative Data from the *National Register of Educational Researchers*: Implications for Research Training," in Clark, D. L., and Hopkins, J. E., *A Study of Roles for Researchers in Education*. Bloomington, Indiana: School of Education, Indiana University, 1968. (Final report of USOE CRP Project X-022).

Worthen, B. R. & Roaden, A. L. *The Impact of Research Apprenticeship Experience*. Columbus, Ohio: Evaluation Center, The Ohio State University, 1968. (Interim report of special PDK study).

Worthen, B. R., Kean, M. H., and McLaughlin, Nancy. *Evaluation of a Process for Selecting and Testing Educational Innovations*. Columbus, Ohio: Evaluation Center, 1969 (Final evaluation report on third year of Xenia City Schools Title III).

Professional Writings (cont.):

Test Authorships

Worthen, B. R. & Stufflebeam, D. L. *The Ohio State University Research Competence Test*. Columbus, Ohio: Test Development Center, The Ohio State University, 1968.

Papers Read

Worthen, B. R. "Some Notions About a Taxonomy of Evaluation Designs." Presented at the American Educational Research Association annual meeting, February 8, 1968.

Worthen, B. R. "A Study of Research Apprenticeships: Implications for Training Educational Researchers." Presented at the American Educational Research Association annual meeting, February, 1969.

Occasional Papers

Hock, M. D. & Worthen, B. R. "Simulation in Program Evaluation: Methods and Materials for Training Personnel." Columbus, Ohio: Evaluation Center, The Ohio State University, 1968. (mimeo, 62 pp.)

Worthen, B. R. "Development of a Functionally Remote Associates Test (FRAT)." Columbus, Ohio: School of Education, The Ohio State University, 1967. (mimeo, 31 pp.)

Worthen, B. R. & Hock, M. D. "A Simulated Evaluation Design Problem: Basis for a Training Institute in Evaluation." Columbus, Ohio: Evaluation Center, The Ohio State University, 1968. (mimeo, 80 pp.)

Worthen, B. R & Roaden, A. L. "Are Members of the American Educational Research Association Researchers?" *Research Paper No. 33*, Laboratory of Educational Research, University of Colorado, October 1969. (mimeo, 38 pp.)

Worthen, B. R. & Clark, P. M. "Toward a Theory of Remote Association." *Research Paper No. 34*, Laboratory of Educational Research, University of Colorado, October, 1969. (mimeo, 41 pp.)

Credentials and References are Available From:

Educational Personnel Placement, The Ohio State University, 1945 North High Street, Columbus, Ohio 43210

(Credentials that include more complete coverage of experience prior to 1965 are available from the University of Utah Placement Office, Salt Lake City, Utah 84112)

XI. Academic Calendar

Fall Semester 1969

August 27 - registration begins
December 20 - conclusion of final examinations

Spring Semester 1970

January 14 - registration begins
May 23 - conclusion of final examinations

Summer Session 1970

June 19 - registration begins
August 14 - conclusion of final examinations

Fall Semester 1970

August 26 - registration begins
December 19 - conclusion of final examinations

Spring Semester 1971

January 13 - registration begins
May 22 - conclusion of final examinations

Summer Session 1971

June 18 - registration begins
August 13 - conclusion of final examinations

XII. Measurement of IER Against Standards for Research Training in Education

Educational researchers, professional educators, social scientists, and government planners are not of one mind as to what constitutes an exemplary research training program. It is doubtful that unanimous agreement among them is attainable on a single issue relevant to whom the next educational researchers should be or what they should be like. Fortunately, however, the problem of research training in education is not totally without a few standards of excellence to which the majority of responsible observers would subscribe. A concise and thoughtful statement of one such set of standards was the product of a Study Group on the Training of Educational Researchers, which was established jointly by the American Educational Research Association and Phi Delta Kappa. The report of this study group was published as *Preparing Research Personnel for Education*, David L. Clark and Blaine R. Worthen, editors (1967 by AERA and Phi Delta Kappa).

On pages 62-64 of the report cited above appear a set of six recommendations for educational research training which will be adopted here as standards against which to measure the quality of the LER training program. Each recommendation (standard) will be stated and followed by a summary evaluation of the LER program relative to that standard.

> 1. Parochialism, in whatever guise, must be abandoned. The disciplinary emphasis must be extended beyond psychology. New R and D roles must be embraced within the research community. All-university concern for research in education must be fostered.

The charge of parochialism in the sense of undergraduate training, course work at the graduate level, and research experiences can certainly not be leveled against the LER training program. As can be seen in Section VI-C, a broad range of undergraduate academic majors are represented in the group of Fellows. Moreover, in Section III-B, it can be shown that 33 per cent of the credit hours of course work taken during 1968-69 were outside of the School of Education. In addition, Fellows consulted with 18 different academic departments and units within the University.

However, the multi-disciplinary nature of the curriculum could be improved. Of the 33 per cent of the course work outside of education, 20 per cent was in psychology. Little or no work was taken in sociology, economics, anthropology, or philosophy. The responsibility of the parochialism of the training program must be borne in equal parts, perhaps, by LER and the academic departments involved. The social sciences have a parochialism of their own which (in many universities) amounts to a thorough lack of concern and interest for anything of importance for education.

2. The centrality of research to the educational enterprise must be affirmed. Schools and colleges of education must produce or admit, once and for all, that they cannot. Local school agencies must be as concerned with improvement as with survival.

Making research central to the efforts of the School of Education of the University of Colorado probably lies beyond the scope of LER's program. However, the total research program of the School of Education must surely have been enhanced by the expenditure of almost 1,500 man-hours by LER Fellows in consultation with School of Education graduate students and faculty.

3. New and vigorous programs of student recruitment must be undertaken to change the character of the graduate student body interested in research in education. Possibilities for careers in educational research must be identified for bright undergraduates in many fields and these students must be encouraged and supported in their pursuit of these career lines.

The LER training program has been conspicuously successful on this point. The LER Fellows can be seen in Section VI to be among the most able entering graduate work in any academic field. The mean Graduate Record Examination (Verbal + Quantitative) score of 1333 is above the 97th percentile of graduating college seniors. The mean age of the twelve Fellows in residence during 1968-69 was 28.7 years. The mean age for the twelve Fellows beginning the 1969-70 year has fallen to about 26 years.

The ability and scholarly promise of the students attracted to the LER training program are its brightest feature.

4. Extensive experimentation should be undertaken in institutional arrangements and program content for the training of researchers in education.

Typical institutional restraints make "extensive experimentation with institutional arrangements" by LER nearly impossible. Such experimenting with arrangements is possible only with the cooperation of other academic departments and the inducement of funds, the latter being a major factor in obtaining the former.

xo 61

Experimentation with the LER training program content is much in evidence. Reactions to course work and internship activities are gathered continuously by both informal and formal means. This constant monitoring of Fellows' reactions to the program content has resulted in the dropping of courses from the core curriculum and the addition of others, the advisement of Fellows on preferred instructors, and changing the internship requirement and arrangements to better fit intern needs.

5. The program content should emphasize opportunities for early production on the part of the student, continuous involvement with productive and successful researchers, and field experiences in the conduct of research.

The LER training program is exemplary with respect to this standard. First, many Fellows have established records of scholarly productivity that far exceed those of most education doctorates in the nation and compare favorably with the early records of present leaders in educational research (see Buswell, et al., "Training for Educational Research," Cooperative Research Project No. 51074, 1966). As can be seen in Section VI, eleven of the twelve Fellows produced scholarly writings during the 1968-69 academic year. The total number of writings and publications by these eleven Fellows was 34; these writings may be classified as follows:

Type of Writing	Frequency
Research Report (excluding theses)	23
Book or Test Review	6
Dissertation or Thesis	5
	34

Continuous involvement of the Fellows with productive and successful researchers and field experiences in the conduct of research are apparent both in the broad scope of LER's consultative services with eighteen departments and units of the University of Colorado and numerous agencies outside the University.

~~84~~ 69

6. The uniqueness of scholarship in education should be recognized and accounted for in planning training programs for research in education. This will mean setting the stage at the graduate level so that subsequent collegial relationships can develop which will allow the researcher in education to bridge his involvement in a social process field and his commitment to a discipline of study.

The objective implied by this recommendation is striven for in each aspect of the LER training program: in recruitment, selection, formal course work, and internship activities.

OE 2244 (3-65)

BUDGET BUREAU NO. 51-R523
APPROVAL EXPIRES: 2-1-67

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education
Washington, D.C. 20202

EDUCATIONAL RESEARCH TRAINING PROGRAM BUDGET

(P.L. 83-531, Section 2 (b), as
amended by P.L. 89-10, Title IV)

USOE USE ONLY

SUPPORT FOR GRANT PERIOD

I. TRAINEE SUPPORT

A. Stipends

1. Level and type	2. Stipend rate	3. No. of trainees	4. Amount
	2,600	3	$ 7,800
	2,800	5	14,000
5. Subtotal:			21,800

B. Dependency allowance

1. Level	2. Rate	3. No. of depend.	4. Amount
Weekly	$ 15		
Acad. yr.	400		
Full yr.	500	20	10,000
5. Subtotal:			10,000

	Amount
C. Travel and relocation costs:	600
D. Total trainee support:	32,400

II. INSTITUTIONAL ALLOWANCE

A. Based on rate per trainee

1. Level and type	2. Rate	3. No. of trainees	4. Amount
Graduate	2,500	8	20,000
B. Total institutional allowance			$ 20,000

III. DIRECT COSTS

A. Personnel

1. Type	2. Full-time	3. Part-time	4. Amount
Program director			$
Prof. staff			
Other staff			
5. Subtotal:			

B. Consumable supplies	
Subtotal:	
C. Equipment	
Subtotal:	
D. Travel	
Subtotal:	
E. Other direct costs	
Subtotal:	
F. Total direct costs:	$

IV. TOTAL SUPPORT REQUESTED FOR PROGRAM PERIOD

Budget allocation	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	Total
Trainee support	$27,300	29,900	36,200	32,400	32,400	$ 158,200
Institutional allowance	20,000	20,000	20,000	20,000	20,000	100,00
Direct costs	14,000	9,333	4,667			28,000
Indirect costs	1,120	747	373			2,240
Total:	$ 62,420	59,980	61,240	52,400	52,400	$ 288,440

NAME OF INSTITUTION
University of Colorado
Boulder, Colorado 80302

PROGRAM TITLE Establishing a Graduate Research Training Program and the Laboratory of Education Research

TECHNICAL PAPER NUMBER 3

APPENDIX C

SAMPLE MEASUREMENT INSTRUMENTS

Attachment I: Course Evaluation Inventory

Attachment II: Trainee Attitude Scale

Attachment III: Trainee Questionnaire on Program Operations

ATTACHMENT I

(**Revised** - **Tentative**)

COURSE EVALUATION INVENTORY

Course____________________ Instructor__________________ Date____________

Directions: Please circle the number that best indicates your response to each item below. A frank and objective response will be appreciated. Omit irrelevant items. Note opportunity for comments on reverse of page. Thank you for your co-operation.

1. The instructor avoided confusing or useless jargon — always 1 2 3 4 5 never
2. His speaking ability (enunciation, volume, etc.) was — excellent 1 2 3 4 5 poor
3. His treatment of students was — courteous 1 2 3 4 5 discourteous
4. The instructor was — over confident 1 2 3 4 5 too unsure
5. He was aware of students' needs, interest, and difficulties — always 1 2 3 4 5 never
6. He was able to alleviate students' difficulties — always 1 2 3 4 5 never
7. He encouraged students to work independently — always 1 2 3 4 5 never
8. His reaction to differences of opinion was — encouragement 1 2 3 4 5 intolerance

Comment: On the back of this sheet, indicate your opinions about the instructor of the course.

9. The instructor's knowledge of the subject was — excellent 1 2 3 4 5 poor
10. The instructor was well-prepared — always 1 2 3 4 5 never
11. The basic concepts were made clear at the beginning of the course — yes 1 2 3 4 5 no
12. The basic concepts were logically developed — always 1 2 3 4 5 never
13. The class was — too teacher-dominated 1 2 3 4 5 too student dominated
14. The presentation of course materials was — informative 1 2 3 4 5 boring
15. The discussions were a waste of time — always 1 2 3 4 5 never
16. The committee/lab work was a waste of time — always 1 2 3 4 5 never
17. The instructor covered the material — too quickly 1 2 3 4 5 too slowly
18. His coverage of material was — too superficial 1 2 3 4 5 too technical

Comment: On the back of this sheet, write your evaluation of your own participation and involvement in the work of this course.

19.	The text, with respect to course objectives, was	relevant	1 2 3 4 5	irrelevant
20.	The text was	too difficult	1 2 3 4 5	too elementary
21.	Reference materials were useful	always	1 2 3 4 5	never
22.	The text was	up-do-date	1 2 3 4 5	outdated
23.	The assignments were clear	always	1 2 3 4 5	never
24.	The number of assignments was	too great	1 2 3 4 5	too small
25.	The assignments were	too difficult	1 2 3 4 5	too simple
26.	The assignments were necessary (not busywork)	always	1 2 3 4 5	never
27.	There was sufficient time for preparation for exams/papers	always	1 2 3 4 5	never
28.	The criteria for grading were clear in advance	always	1 2 3 4 5	never
29.	The concepts emphasized on exams/papers were relevant	always	1 2 3 4 5	never
30.	The number of exams/papers was	too great	1 2 3 4 5	too small
31.	The exams/papers were	too long	1 2 3 4 5	too short
32.	The exams/papers were	too difficult	1 2 3 4 5	too simple
33.	The instructor graded fairly	always	1 2 3 4 5	never
34.	The instructor returned papers promptly	always	1 2 3 4 5	never
35.	The subject matter, methods, or skills learned will be	very useful	1 2 3 4 5	useless
36.	The subject matter was	up-to-date	1 2 3 4 5	outdated
37.	The course should be given to students who are	more advanced	1 2 3 4 5	less advanced
38.	The subject matter was intellectually stimulating	always	1 2 3 4 5	never
39.	Considering the credit-hours, the work required should be	more	1 2 3 4 5	less
40.	I would like to take another course in this subject area	definitely	1 2 3 4 5	definitely not

Comment: Please write specific suggestions for improving the course, student participation and involvement, or instructor on the back of this sheet.

ATTACHMENT II

CIRCE Attitude Scale No. 1.3

Name ____________________

Attitudes toward Educational Evaluation. Below are a number of statements about the evaluation of educational programs. A program can be a lesson, a course, a whole curriculum, or any training activity. Consider each statement as a statement of opinion. If you agree at least a little bit with the statement, circle the letter A. If you disagree even a little bit with the statement, circle the letter D. If you both agree and disagree, or if you have no opinion, leave the letters uncircled.

A = AGREE **D = DISAGREE** **Blank = Neither**

1. A D The **major** purpose of an educational evaluation study should be to gather information that will be helpful to the educators.
2. A D It is important for the program evaluator to find out how well various people like the program.
3. A D Generally speaking, an educational program should be evaluated with reference to one or more "control" programs.
4. A D The evaluator should accept the responsibility of finding the strongest, most defensible, and publicly attractive points of the program.
5. A D In evaluating a program, it is at least as important to study and report on the types of teaching as it is to study and report on the amount of learning.
6. A D The evaluator should draw a conclusion as to whether or not the goals of the program are worthwhile.
7. A D It is more important to evaluate a program in comparison to what other programs do than to evaluate it with reference to what its objectives say it should do.
8. A D Principals and superintendents should not gather data about the quality of instruction in the classroom.
9. A D The task of putting educational objectives into writing is **more** the responsibility of the evaluator than that of the educator.
10. A D It is essential that the full array of educational objectives be stated before the program begins.
11. A D Evaluation studies would improve if they gathered more kinds of information, even if at the expense of gathering less reliable information.
12. A D Evaluators should ignore data that cannot be objectively verified.
13. A D Education should have more of an engineering orientation than it now has.
14. A D The job of an evaluator is mostly one of finding out how well students learn what they are supposed to learn.
15. A D Evaluation should aid an educator in revising his goals even while the program is in progress.
16. A D The process of decision-making about the curriculum is one of the weakest links in the present operation of the schools.
17. A D Educators have some important aims that **cannot** be stated adequately by anyone in terms of student behaviors.
18. A D Information from an evaluation study is not worth the trouble it makes.
19. A D The first job in instruction is the formulation of a statement of objectives.
20. A D A teacher should tell his students any and all of his teaching objectives.
21. A D The **major** purpose of educational evaluation is to find out the worth of what is happening.
22. A D The evaluator should be a facilitator more than a critic or reformer or scholar.
23. A D Some school experiences are desirable because they round out a child's life—whether or not they increase his competence or change his attitudes.

Please turn over

24. A D An evaluator should find out if the teaching is in fact the kind that the school faculty expects it to be.

25. A D In selecting the criteria for evaluating an educational program it is generally better to concentrate on the objectives that it shares with other programs of its kind rather than to concentrate on its unique objectives.

26. A D The **main** purpose of evaluation is to gain understanding of the causes of good instruction.

27. A D Description and value judgment are equally important components of evaluation.

28. A D In conducting an evaluation, there is no justification for the exercise of subjective judgment of any kind by the evaluator.

29. A D Educational evaluation is a necessary step in the everyday operation of the school.

30. A D The strategy of evaluation should be chosen primarily in terms of the particular needs the sponsors have for evaluation data.

31. A D The educational evaluator should attempt to conceal all of his personal judgment of the worth of the program he is evaluating.

32. A D The sponsor of an evaluation should have the final say-so in choosing or eliminating variables to be studied.

33. A D An evaluator should concentrate on gathering data about the costs and benefits of the program.

34. A D Parents' attitudes should be measured as part of the evaluation of school programs.

35. A D An evaluator finds it almost impossible to do his job without intruding upon the operation of the program at least a little.

36. A D All important educational aims can be expressed in terms of student behaviors.

37. A D Some educational goals are best expressed in terms of teacher behaviors.

38. A D The principal purpose of evaluation is to test out theories and hypotheses.

39. A D An evaluation study should pay less attention to the statistical significance of a finding than an instructional research study would.

40. A D Evaluation interferes with the running of schools more than it helps.

41. A D Little evaluation planning can be done before you get a statement of instructional objectives.

42. A D The leader of an evaluation team should be a teacher.

43. A D The entire school day and the entire school experience should be divided up and assigned to the pursuit of stated educational goals.

44. A D An evaluation of an educational program should **include** a critical analysis of the value of the goals of the program.

45. A D Every teacher should have formal ways of gathering information about the strengths and shortcomings of his instructional program.

46. A D Money spent on evaluation contributes more to the improvement of education than any other expenditure.

47. A D There just is no way that careful and honest evaluation can hurt a school program.

48. A D If an evaluation study is well designed, the primary findings are likely to improve decisions made by administrators, teachers, and students themselves.

CIRCE Attitude Scale 1.3b **Name**______________________________

Different people have different ideas about the evaluation of educational programs. Some believe that maintaining a good school and improving instruction require carefully planned evaluation. Others believe that evaluation activities interfere with teaching and learning, doing more harm than good.

Different people see different purposes for educational evaluation. Certain people are oriented more to pupil behaviors or to classroom conditions or to other aspects of the program.

Responses to the items on this attitude scale provide us with 6 scale scores. When plotted on the profile sheet below they are expected to indicate the respondent's attitudes toward educational evaluation.

Directions for Self Scoring

Start in the opposite corner of this page. For each scale check your sheet to see how you responded to each of the eleven items. For Example, with SCALE V how did you mark Item #2? If you marked it "A" put a check in the parentheses. Put the number of checks in the box. Mark each horizontal scale (at the right) at the number-point shown in its box. Draw your profile by connecting your scores on the five scales, I-V. Then find your CONFIDENCE score.

SCALE I

3 A ( )
4 D ( )
11 D ( )
16 A ( )

22 D ( )
26 A ( )
30 D ( )
31 A ( )

32 D ( )
39 D ( )
44 D ( )

Total ☐

I. A RESEARCH orientation to Evaluation 0 1 2 3 4 5 6 7 8 9 10 11

The person high on this scale appears to believe that evaluation should rely on precise measurement and statistical analysis to gain **general understanding** of why programs do or do not succeed.

SCALE II

1 A ( )
2 D ( )
4 A ( )
10 D ( )

13 D ( )
15 A ( )
16 D ( )
22 A ( )

30 A ( )
32 A ( )
35 D ( )

Total ☐

II. A SERVICE orientation to Evaluation 0 1 2 3 4 5 6 7 8 9 10 11

The person high on this scale appears to believe that evaluation should be designed according to the **needs of the educators** involved so as to aid them in their present work and future decisions.

SCALE III

5 A ( )
9 A ( )
17 A ( )
20 D ( )

22 A ( )
23 A ( )
24 A ( )
34 A ( )

36 D ( )
37 A ( )
42 A ( )

Total ☐

III. A TEACHING orientation to Evaluation 0 1 2 3 4 5 6 7 8 9 10 11

The person high on this scale appears to believe that evaluation should be focused considerably on the **quality of teaching** and should discover the intrinsic merit in facilities and in instruction.

SCALE IV

5 D ( )
7 D ( )
10 A ( )
14 A ( )

17 D ( )
19 A ( )
36 A ( )
37 D ( )

41 A ( )
43 A ( )
44 A ( )

Total ☐

IV. OBJECTIVES orientation to Evaluation 0 1 2 3 4 5 6 7 8 9 10 11

The person high on this scale appears to believe that instruction, and therefore evaluation, should be focused considerably on apriori statements of objectives, that the merit of the program is largely indicated by the **success of students** in reaching those objectives.

SCALE V

Item 2 A ( )
4 A ( )
6 A ( )
12 D ( )

21 A ( )
27 A ( )
28 D ( )
31 D ( )

34 A ( )
39 A ( )
44 A ( )

Total ☐

V. A JUDGMENT orientation to Evaluation 0 1 2 3 4 5 6 7 8 9 10 11

The person high on this scale appears to believe that educational evaluation is largely a matter of establishing the worth of the program for various purposes **as perceived** by various groups of persons in and around the program.

START →

To obtain an overall……………………**CONFIDENCE IN EVALUATION score,**
do the same thing with
the check-list at the right.

0 1 2 3 4 5 6 7 8 9 10 11

Confidence Scale

Item 8 D ( )
12 D ( )
15 A ( )
18 D ( )

29 A ( )
34 A ( )
40 D ( )
45 A ( )

46 A ( )
47 A ( )
48 A ( )

☐

ATTACHMENT III

TRAINEE QUESTIONNAIRE ON PROGRAM OPERATIONS

Please answer the following questions. If you would like to expand on any of your answers, use the margin.

1. Did the unavailability of books and journals interfere with attempts to master the content of the training program?

_____Yes
_____No

2. Did reproduced material handed out by the staff help you?

_____Yes
_____No

3. Did you lack a place to work?

_____Yes
_____No

4. Was your housing satisfactory?

_____Yes
_____No

5. Which features of the classrooms were inadequate?

___Ventilation bad (including cigarette smoke)
___Acoustics (inability to hear)
___Too large and spread out
___Needed overhead or neck microphone
___Other (Specify)______________________________

6. Which features facilitated learning?

___Space to spread out materials
___Public address system
___Chalkboards
___Raised platform for lecturers
___Other (Specify)______________________________

7. Was the length of the training program appropriate, too long, or too short?

___Appropriate
___Too long
___Too short

8. Were lectures too long?

_____Yes
_____No

9. Were the lectures appropriately scheduled?

_____Yes
_____No

10. Did you have sufficient opportunity to interact with colleagues?

_____Yes
_____No

11. Were the instructors too unapproachable or inaccessible?

_____Yes
_____No

12. Were graduate student assistants helpful in solving your individual problems?

_____Yes
_____No

13. Did the evaluation interfere with your work?

_____Yes
_____No

14. Did you object to spending time on evaluation?

_____Yes
_____No

15. Was the instruction generally well organized?

_____Yes
_____No

16. Did the content of the lectures presuppose more training in mathematics and statistics than you had?

_____Yes
_____No
_____Yes (slightly more)

17. Should less, or more, pretraining be presupposed?

_____Less
_____More
_____About right

18. To what extent was the content relevant to what you hoped to accomplish?

_____Relevant
_____Not too relevant

19. a. Were the lecturers stimulating and interesting?
    b. Were the discussions successful?
    c. Were the lecturers competent to speak on their topics?
    d. Were the lecturers well prepared?

	Yes	No
a.	___	___
b.	___	___
c.	___	___
d.	___	___

20. Were you disappointed in any way with the participants?

_____Yes
_____No
If yes, specify why______________________________

____

21. If you had it to do over again would you apply for the training program that you have just completed?

_____Yes
_____No

22. If a program such as this is held again would you recommend to others like you that they attend?

_____Yes
_____No

23. Do you feel that your understanding of evaluation (development) has been considerably enriched by this program?

_____Yes
_____No

24. Do you feel that anything has happened during this training program to make it more likely that you will leave your present position of employment?

_____Yes
_____No

25. How valuable were your courses, in your opinion, in preparing you for your occupational responsibilities? Rank order the courses, from most to least helpful, below.

Most helpful 1_______________

2_______________

3_______________

4_______________

5_______________

Least helpful 6_______________

26. How valuable was the weekly non-credit seminar in preparing you for your occupational responsibilities? Please indicate below.

27. How valuable was your internship experience(s) in preparing you for your occupational responsibilities? Please indicate in the space provided below.

TECHNICAL PAPER NUMBER 3

APPENDIX D

EVALUATION OF LONG-RANGE EFFECTS OF A 1967 RESEARCH TRAINING PRESESSION

EVALUATION OF LONG-RANGE EFFECTS OF A 1967 RESEARCH TRAINING PRESESSION

The evaluation of the 1968 Presessions Program necessarily deals with short-term effects. Some indication of the long-term effects of the AERA Presessions Program are given in this section.

A brief questionnaire was mailed to the 70 participants of the 1967 Presession on the Design and Analysis of Comparative Experiments. This Presession was held at Grossinger, New York, on February 3-7, 1967, and was under the direction of Gene V. Glass, Kenneth D. Hopkins, and Jason Millman. Thus, the questionnaire sought to assess the effects of one 1967 Presession more than one year later. A total of 47 of the 70 participants responded to the questionnaire, producing a fairly typical return rate of 67%. The results are reported on the questionnaire itself in Table B.

Table B
AERA 1967 Presession Questionnaire
Follow-up Evaluation

Responses of the 47 respondents are recorded below:

1. a. Have you made an attempt in the last 15 months to increase your knowledge of experimental design and analysis as a result of your attendance at the 1967 Presession (i.e., did you do something you might not have done if you hadn't attended the Presession?)?

Yes - 41 No - 2 (Circle one)
No response - 4

b. If "Yes," how?

freq.
36 1. By studying the instructional materials handed out at the Presession.
35 2. By independent study from textbooks.
1 3. By enrolling in a formal course.
6 4. By attending one of the 1968 Presessions.
5 5. By attending some other "short-course" or "workshop".
5 6. Other. Please specify: 1. Conducting a 1968 Presession, 2. Teaching experimental design, 3. Writing a book, 4. Designing a new course.

2. a. Can you point to some specific use you have made of the skills and knowledge acquired at the 1967 Presession?

Yes - 46 No - 0 (Circle one)
No response - 1

b. If "Yes", what use(s)?

freq.

31 1. In the design or analysis of research performed by me.
25 2. In consulting with collegues.
25 3. In consulting with others on the design and analysis of experiments.
20 4. In teaching my classes.
36 5. In advising graduate students engaged in research.
__ 6. Other. Please specify:

3. a. Have you felt more competent to read the research literature in your research specialty over the past 15 months than before as a result of the 1967 Presessions?

Yes - 40 No - 7 (Circle one)

b. Have you felt more competent to design and analyze experiments over the past 15 months as a result of the 1967 Presessions?

Yes - 46 No - 1 (Circle one)

4. a. Have you written a research paper-either published or unpublished-which benefited from your attendance at the 1967 Presession?

Yes - 27 No - 19 (Circle one)
No response - 1

1. If "Yes", and if the paper or papers were published, where were they or will they be published?
J. Ed. Psych. - 3; USOE Report - 2; Amer. J. Ment. Def.-2; J. Ed. Res. - 2; Reading Teacher; Child Devel.; J. Hum. Res.; Psych. in Schools; J. Creat. Bev.; Read. Res. Quar.; EPIE Forum.

5. a. Have the conditions of your employment changed wholly or partially as a result of your attendance at the 1967 Presession?

Yes - 7 No - 39 (Circle one)
No response - 1

If "Yes", please explain: was made Res. Dir. at SUNY; increase in teaching exper. des.; directs research of graduate students.

b. Have you taken a more active interest in some professional organization (e.g., AERA, ASCD) as a result of the 1967 Presession?

Yes - 16 No - 31 (Circle one)

If "Yes", which organization: AERA named 14 times. Other organizations named were PDK, Amer. Voc. Ed. Res. Assoc., ASCD, Can. Ed. Res. Assoc.

6. Please rank each of the following activities from 1 (most valuable) to 5 (least valuable) in terms of the value of the activities for your professional growth:

Average Rank	Activity
1.71	A post-doctoral fellowship for a year of study.
3.02	An AERA Presession like the one you attended.
2.69	An eight-week "summer institute".
3.87	Self-study from textbooks.
3.71	A semester-long academic course.

The responses to item #1 indicate that in almost all cases (41 out of 47) the 1967 Presession acted as a stimulus to further study. Study of the subject matter did not cease with the end of the five-day sessions but was extended through self-study of textbooks. From the wording of the question, we may assume that these extended efforts at self-improvement can be attributed to attendance at the 1967 Presession.

We see in item #2 that the skills acquired during the 1967 Presession were applied in educational research endeavors. About 80% of the respondents reported that the Presession helped them in advising graduate students engaged in research. About 60% of the respondents reported using the skills they acquired in designing and analyzing their own research. More than half of the respondents were helped in consulting with their colleagues and others on research design and analysis. Somewhat less than half of the respondents made use of the newly-acquired skills in their teaching. A "spread of effect" of instruction is evident in the responses to item #2. Indeed, it is probably no exaggeration to say that literally hundreds of persons (students, faculty members, public school personnel, etc.) benefited-to a greater or lesser extent-from the instruction given to 70 participants in the 1967 Design and Analysis Presession.

In item #3, it is seen clearly that in the opinion of the respondents, participation in the 1967 Presession resulted in increased research competence which was not transitory, but was maintained 15 months after the Presession.

In item #4, about 60% of the respondents indicated that the skills acquired in the 1967 Presession were put to use in reporting published or unpublished research. As can be seen under 4(a), an impressive array of professional journals are the benefactors of instruction at the 1967 Design and Analysis Presession.

Seven out of 47 persons indicated in item #5 that the conditions of their employment were changed as a result of of attendance at the 1967 Presession. In all but one instance, the "change" was one of emphasis and responsibility at the participant's previous place of employment instead of a change of place of employment. In part(b) of #5, 14 of 47 persons indicated that they have taken a greater interest in AERA as a result of attendance at the 1967 Presession.

Item #6 is of particular interest. Respondents were asked to rank five educational activities from 1 (most valuable) to 5 (least valuable) in terms of their professional growth. Average ranks were calculated for the rankings of the 47 respondents. The lower the average rank, the more valuable the activity was considered to be by the group of respondents. Attendance at an AERA Presession was ranked third among the five activities. The respondents considered the Presession more valuable than taking a semester-long academic course or self-study from textbooks. Indeed, attendance at a Presession was considered only slightly less valuable than attendance at an eight-week long "summer institute".

Conclusion: The effects of a 1967 Presession were maintained over 15 months, were spread to the colleagues and students of the participants, and were considered only slightly less valuable than those which might result from attendance at an eight-week "summer institute".